

Transportation 2035 Plan for the San Francisco Bay Area

Draft Equity Analysis Report January 2009



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EXECUTIVE SUMMARY

The purpose of this report is to assess the equity implications of the Metropolitan Transportation Commission’s regional transportation plan, *Transportation 2035: Change in Motion*. As the federally designated metropolitan planning organization for the nine-county Bay Area, MTC is responsible for developing the region’s long-range strategic plan to shape transportation investments over the next 25 years. This equity analysis is intended to ensure that minority and low-income communities in the region share equitably in the Plan’s benefits without bearing a disproportionate share of the burdens. As an assessment of the region’s long-range transportation investment strategy, this analysis is conducted at a regional, program-level scale.

This assessment of the long-range plan is intended to satisfy federal requirements under Title VI of the Civil Rights Act and federal policies and guidance on environmental justice. As a metropolitan planning organization, MTC is required to identify the benefits and burdens of metropolitan transportation system investments for different socioeconomic groups. There is, however, no standard federal policy or guidance related to how an environmental justice assessment or equity analysis should be performed for a long-range plan, nor are there identified standards against which MTC can measure its findings. For each regional transportation plan developed since 2001, MTC staff have worked with various stakeholders to update and refine the Equity Analysis methodology, taking into account input from MTC’s Minority Citizens Advisory Committee (MCAC), members of the public, and other stakeholders.

METHODOLOGY

This analysis measures equity in two different ways: Equity of the Transportation 2035 Plan’s financial investments on a per-household basis, as well as selected travel-related outcomes related to the investments. The five equity measures analyzed are:

- Financial analysis of Plan investments
- Access to low-income jobs by auto and transit
- Access to non-work activities by auto and transit
- Vehicle emissions
- Housing and transportation affordability (test measure)

To evaluate equity with respect to the Plan’s **financial investments**, Plan expenditures are divided into two categories, roads/highways and public transit, and then allocated as benefits either to low-income households (based on low-income households’ share of system usage) or other households (based on other households’ share of system usage). Each income group’s total benefit is then divided

by the total number of either low-income or all other households to determine a per-household benefit for low-income households and a per-household benefit for all other households.

To evaluate equity in terms of the Plan's transportation outcomes, the region is broken out geographically into defined low-income/minority communities of concern (communities with at least 70% minority population or 30% low-income population) and the remainder of the region. MTC's travel forecasting system produces estimates of socioeconomic and travel characteristics across several planning alternatives for both communities of concern and the remainder of the region. Results are then compared to answer two key questions:

- (1) Does the Transportation 2035 Plan improve conditions for communities of concern, relative to the No Project scenario?
- (2) Do communities of concern receive similar or greater benefit compared to the remainder of the region under the Transportation 2035 Plan relative to the No Project alternative?

REGIONAL TRENDS OVERVIEW

To help contextualize the equity analysis and the Transportation 2035 Plan's investment strategies, this report also summarizes recent demographic and socioeconomic trends based on regional data drawn from the American Community Survey for 2006 and 2007 as well as MTC estimates of household transportation costs. Key regional trends identified for the region since 2000 include:

- **Increasing Minority Population** The region's minority population continues to grow in number and share, with Hispanic/Latino and Asian populations growing fastest.
- **Rise in and Decentralization of Low-Income Population** Growth in the low-income population (below 200% of the federal poverty level) outpaced that of the non-low-income population between 2000 and 2007, to rise both in absolute terms and as a share of the total population. Meanwhile, a growing share of the region's low-income population resides outside the region's central cities of San Francisco, Oakland, and San Jose, in locations that are less well served by public transit.
- **Increased Access to Autos** Access to autos increased between 2000 and 2007, notably among low-income and minority households. However, a larger share households is forecast to have zero vehicles in 2035 compared to today.
- **Housing and Transportation Affordability Challenges** Low-income households earning less than \$40,000 per year spend an estimated average of 26.7% of household income on transportation costs, about twice the regional average. When combined with housing costs (an average of 50.3% of income), the average low-income household in the region spends an estimated 77.0% of income on housing and transportation combined. On average, the majority of transportation costs in all income groups are automobile ownership and operating costs.

ANALYSIS RESULTS: KEY FINDINGS

Financial Analysis The purpose of the financial analysis is to compare the per-household allocation of Transportation 2035 expenditures between low-income households and all other households. The key question addressed is: “Are low-income households sharing equitably in the Plan’s financial investments?” Overall, this analysis suggests how the Transportation 2035 Plan’s major investments in public transit, which is proportionately utilized more heavily by low-income households (26.7% of usage), results in a greater overall per-household expenditure for low-income households (\$93,900 total per household over 25 years) than other households in the region (\$90,700 per household over 25 years). The following table summarizes this analysis by income group, where Plan expenditures are allocated to different income groups based on their share of system usage:

	ALL Households	Low Income Households	ALL Other Households
Share of Transit Usage	100.0%	26.7%	73.3%
Share of Road/Highway Usage	100.0%	2.4%	97.6%
T2035 Transit Expenditure (\$Billions)	\$148.9	\$39.7	\$109.2
T2035 Road/Highway Expenditures	\$76.4	\$1.3	\$75.1
Total Expenditures	\$225.3	\$41.0	\$184.3
Households (2006)	2,468,024	436,554	2,031,470
Per-Household Expenditure (\$000s)	\$91.3	\$93.9	\$90.7

Source: MTC Draft Transportation 2035 Plan and 2006 American Community Survey

Outcomes Analysis The remaining equity indicators estimate travel outcomes related to the Transportation 2035 Plan’s investments, including accessibility, vehicle emissions, and affordability (a test measure). For each indicator, the analysis assessed current conditions in communities of concern versus the remainder of the region as of the 2006 base year, and also assessed (1) whether the Plan’s investments improved conditions in communities of concern relative to the No Project scenario and (2) whether communities of concern receive similar or greater benefit compared to the remainder of the region under the Project, relative to the No Project scenario. These results for each indicator are summarized in the following table:

Key questions	Low-Income Jobs Accessible by Auto	Low-Income Jobs Accessible by Transit	Access to Non-Work Activities by Auto	Access to Non-Work Activities by Transit	Emissions Density	Affordability
Are conditions in communities of concern better overall than the remainder of the region?	Yes	Yes	Yes	Yes	No	No
Do conditions in communities of concern improve under the Project relative to the No Project?	Yes	Yes	Yes	Yes	Yes	No Change
Do communities of concern receive similar or greater benefit compared to the remainder of the region under the Project, relative to the No Project?	Yes	No	Yes	Yes	Yes	Yes

CONCLUSIONS AND NEXT STEPS

Based on the analysis results, this report draws the following conclusions:

- The Transportation 2035 Plan features greater per-household expenditures for low-income households than other households.
- Similar or greater benefits accrue to low-income and minority communities of concern under the Transportation 2035 Plan than the remainder of the region, with the exception of access to low-income jobs within 30 minutes by transit.
- The Plan helps close the “accessibility gap” between automobile and transit accessibility, in terms of the difference between how much one can access by auto versus transit.
- Greater benefits appear to be achieved for communities of concern both through the alternative land use scenario (more compact growth) and through technology (addressing vehicle emissions) than by transportation investments alone.
- The affordability test measure proved challenging to forecast for 2035, due to the difficulty of forecasting housing costs. This indicator may ultimately be more effective as a shorter-term measurement defined and assessed neighborhood by neighborhood.

Some stakeholders, including MTC’s Minority Citizen’s Advisory Committee, ultimately felt that the analysis results didn’t adequately represent the impacts of the Transportation 2035 Plan on the region’s low-income and minority communities, mainly due to the limitations of the long-range forecasting methodology used and the socioeconomic assumptions underlying MTC’s estimates.

Based on these findings, this report has identified the following next steps to continue to advance transportation equity in the region:

1. **Promote Involvement in Activity-Based Model Development** MTC will work with stakeholders in the development of MTC’s next-generation activity-based travel model.
2. **Develop a Regional Mobility Snapshot Analysis** MTC will undertake a neighborhood-level assessment of transit service and accessibility to analyze in greater detail how and whether mobility is improving in communities of concern.
3. **Monitor and Evaluate the Lifeline Transportation Program** MTC will continue to monitor and evaluate the Lifeline Transportation Program to ensure it meets its goals of improving mobility for the region’s low-income population.
4. **Complete Remaining Community Based Transportation Plans** MTC has fully funded locally based transportation needs assessments for 43 communities of concern.
5. **Support the Bay Area Air Quality Management District’s CARE Program** The Community Air Risk Evaluation (CARE) Program seeks to identify significant sources of toxic air contaminant (TAC) emissions (including on-road mobile sources from vehicles) and prioritize use of resources to reduce TACs in the most highly impacted areas.
6. **Further Evaluate Housing and Transportation Affordability in the Region** MTC is conducting a more detailed study of housing and transportation affordability in the region. This study is expected to be available in spring 2009.

1 INTRODUCTION

Chapter Highlights

- **The purpose of this report is to assess the equity implications of MTC's long-range regional transportation plan, *Transportation 2035: Change in Motion*.**
- **Equity is evaluated by assessing whether the distribution of benefits and burdens in transportation investments is fair across different groups or populations. This analysis focuses on communities with concentrations of low-income and/or minority residents.**
- **As part of the long-range transportation planning process, MTC is required to comply with several federal regulations related to civil rights and environmental justice. In addition, MTC has adopted its own environmental justice principles to guide regional policy.**

The purpose of this report is to assess the equity implications of the Metropolitan Transportation Commission's regional transportation plan, *Transportation 2035: Change in Motion*. As the federally designated metropolitan planning organization (MPO) for the nine-county Bay Area, MTC is responsible for developing the region's long-range strategic plan to shape transportation investments over the next 25 years. This equity analysis is intended to ensure that minority and low-income communities in the region **share equitably in the Plan's benefits without bearing a disproportionate share of the burdens**. As an assessment of the region's long-range transportation investment strategy, this analysis is conducted at a regional, program-level scale.

1.1 About the Transportation 2035 Plan

Transportation 2035: Change in Motion is the Bay Area's transportation blueprint for investing \$226 billion in projected revenue expected to flow to the region over the next 25 years. These revenues come from a variety of federal, state, regional, and local sources. Investments in the region's transportation system include expansion of the transit, bicycle, pedestrian, and road networks, but mostly go toward maintaining the large, complex, multi-modal system that has been developed over the past several decades as the region, its population, and its economy have grown.

The Transportation 2035 Plan is guided by the "three E's" of Economy, Environment, and Equity. Rooted in these principles are goals to "support a prosperous and globally competitive economy, provide for a healthy and safe environment, and produce equitable opportunities for all Bay Area residents to share in the benefits of a well-maintained, efficient

regional transportation system.”¹ The Plan’s two overarching goals to promote equity are Equitable Access and Livable Communities. The Transportation 2035 Plan directs specific investments and strategies to promote each, including substantial new investments in the Lifeline Transportation Program and the Transportation for Livable Communities program.

In addition to this equity analysis of the Plan’s benefits and burdens, the Transportation 2035 Plan also used performance evaluation metrics to assess equity. The project performance assessment process under which individual transportation projects were evaluated for their ability to meet Plan goals included a test measure of project cost per low-income household served.²

While these elements underscore how equity is a cross-cutting part of the Transportation 2035 Plan’s development and direction, the crux of this equity analysis is assessment of the effects of the Plan and its investments on the region’s low-income and minority communities. The following section provides a discussion of transportation equity in the context of this analysis of the long-range Plan’s investments and forecasted outcomes.

1.2 Transportation Equity: A Discussion

Central to any equity analysis is the idea of equity. The idea of equity in our society has many often-distinguished but nevertheless interrelated dimensions that have to do with justice or fairness for all persons: social equity, economic equity, environmental equity, and so on. The idea of “transportation equity” is complex, just as our transportation system is, in terms of what comprises it, who uses it, and how people use it. One accepted definition of transportation equity relevant to long-range planning is “the fair or just distribution of impacts.”³ In the context of transportation, these impacts can take the forms of benefits (financial investments that benefit users, or accessibility improvements, for example) as well as burdens (such as environmental effects of vehicle emissions). In order to assess long-range distributional effects of the Plan for equity, MTC must produce estimates of the Plan’s effects in the forecast year 2035, and compare the effects that accrue to communities with high concentrations of low-income or minority residents to the effects that accrue to the remainder of the region.

¹ The complete Draft Transportation 2035 Plan is available at http://www.mtc.ca.gov/planning/2035_plan and at the MTC-ABAG library.

² Information on the Vision Analysis and Project Performance Assessment is detailed in the *Transportation 2035 Plan Performance Assessment Report*, available at http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035Plan-Perf_AssessmentReport.pdf and from the MTC-ABAG library.

³ Litman, 2007. “Evaluating Transportation Equity: Guidance for Incorporating Distributional Impacts in Transportation Planning.” Victoria Transport Policy Institute.

ENVIRONMENTAL JUSTICE IN TRANSPORTATION

In addition to the idea of fairness, equity also represents justice, the idea that all people should be treated fairly and their fundamental rights as individuals upheld. From this basis, the idea of environmental justice took hold, originally stemming from concerns over the siting of hazardous facilities disproportionately in low-income and minority neighborhoods. At its origin, environmental justice has two key elements: (1) addressing the civil rights concerns over disparate environmental impacts of projects and programs on low-income and minority communities; and (2) that people in these communities have full and fair access to the decision-making processes that affect them. Environmental justice in a transportation context often deals with the location and accessibility of transportation facilities, and the fair distribution of any positive and negative social, economic, and environmental impacts from those facilities across different racial, ethnic, and income groups.

To advance equity and justice in public processes and decision-making, federal and state policies and regulations related to civil rights and environmental justice have been established, beginning with federal civil rights legislation in the 1960s and continuing with environmental justice regulations in the 1990s. The following section describes how these policies and regulations apply to transportation decision-making and to this equity analysis.

1.3 Regulatory and Policy Context for Environmental Justice in Long-Range Transportation Planning

One of MTC’s responsibilities as a federally designated MPO is to develop a long-range regional transportation plan (RTP) and update the plan every four years. This section describes the legal, regulatory, and policy framework for environmental justice as it relates to the long-range transportation planning process and this equity analysis of the Plan’s investments. This framework is a mix of federal laws and regulations, and MTC’s own adopted environmental justice principles.

TITLE VI OF THE CIVIL RIGHTS ACT

The federal Civil Rights Act of 1964 has two key provisions that are the basis of environmental justice. Section 601 of Title VI states: “*No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*” Section 602 also empowers federal departments and agencies (such as the Department of Transportation and its various agencies) to promulgate rules and regulations that implement this provision.

FEDERAL GUIDANCE ON ENVIRONMENTAL JUSTICE

In 1994, President Clinton signed Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which states, “Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” The identification of low-income populations is an additional distinction to the provisions of the Civil Rights Act, which prohibits discrimination on the basis of race, color, or national origin only.

The U.S. Department of Transportation incorporated all these populations into its guidance on environmental justice. In particular, DOT directs its agencies to adhere to three environmental justice principles outlined by the Executive Order:⁴

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Furthermore, in addition to these directions required of all DOT agencies, in 1998 the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), two agencies within DOT, jointly issued guidance specifying responsibilities for metropolitan planning processes, which includes MTC’s development of the region’s long-range transportation plan (other directives apply to activities carried out by state DOTs and public transit agencies). Under this FHWA/FTA guidance,⁵ MPOs must:

- Enhance analytical capabilities to ensure that the long-range transportation plan and transportation improvement program comply with Title VI.
- Identify residential, employment, and transportation patterns of low-income and minority populations, identify and address needs, and assure that benefits and burdens of transportation investments are fairly distributed.
- Improve public involvement processes to eliminate participation barriers and engage minority and low-income populations in transportation decision-making.

MTC carries out each of these directives by (a) continually gathering and analyzing regional demographic and travel data and refining its analytical capabilities; (b) supporting locally

⁴ See DOT order http://www.fhwa.dot.gov/environment/ejustice/dot_ord.htm.

⁵ More information at the FHWA/FTA Environmental Justice web site, <http://www.fhwa.dot.gov/environment/ej2000.htm>.

based needs assessments in low-income and minority communities through the Community Based Transportation Planning program, funding projects targeting low-income communities through the Lifeline Transportation Program, and conducting an equity analysis of each long-range Regional Transportation Plan (which this report summarizes); and (c) examining and refining the agency’s public involvement process to ensure full and fair participation in decision-making.⁶

MTC’S ENVIRONMENTAL JUSTICE PRINCIPLES

In 2006, MTC adopted two Environmental Justice Principles advanced by its Minority Citizens Advisory Committee to serve as the environmental justice framework for the Commission’s activities. They are:

1. Create an open and transparent public participation process that empowers low-income communities and communities of color to participate in decision making that affects them.
2. Collect accurate and current data essential to defining and understanding the presence and extent of inequities, if any, in transportation funding based on race and income.

All of these ideas, goals, laws, regulations, and policies form the basis of analyzing MTC’s Transportation 2035 Plan for equity. However, no specific federal standard policy or guidance exists related to how an environmental justice assessment or equity analysis should be performed for a long-range plan, nor are there identified standards against which MTC can measure its findings. For each RTP, MTC staff has worked with various stakeholders to update and refine the equity analysis methodology, taking into account input from stakeholders including MTC’s Minority Citizens Advisory Committee (MCAC), other public agencies, and members of the public. The following chapter summarizes the methodology used in this analysis.

⁶ More information on MTC’s Public Participation efforts and a copy of the most recent Public Participation Plan is available at http://www.mtc.ca.gov/get_involved/participation_plan.htm. For a summary of the Public Participation process specific to the Transportation 2035 Plan, see the Public Outreach and Involvement Program Report, available at http://www.mtc.ca.gov/planning/2035_plan/. Both reports are also available from the MTC-ABAG library.

2 METHODOLOGY

Chapter Highlights

- **Equity is measured two different ways: Equity of the Transportation 2035 Plan’s financial investments as well as travel-related outcomes related to the Plan’s investments: accessibility, emissions, affordability.**
- **To evaluate equity in outcomes, the region is broken out into defined low-income/minority communities of concern and the remainder of the region.**
- **Various data sources generate estimates of socioeconomic and travel characteristics across several planning alternatives for both communities of concern and the remainder of the region. These estimates are aggregated to regional equity indicators representing potential benefits and burdens of implementing the Transportation 2035 Plan.**
- **The difference in the horizon year 2035 between implementing the Transportation 2035 Plan (the Project) and not implementing the Plan (the No Project alternative) is compared to evaluate two questions: (1) Does the Transportation 2035 Plan improve conditions in communities of concern? and (2) Do communities of concern fare equally or better than the remainder of the region under the Transportation 2035 Plan?**

This section provides an overview of the methodology used to conduct the Transportation 2035 Equity Analysis, including definitions, data sources, descriptions of the different planning alternatives being evaluated, and how equity indicators used in this analysis are produced and evaluated.

2.1 Definitions

MINORITY

MTC uses the U.S. Census Bureau’s definitions of different racial and ethnic populations to determine minority status among the Bay Area population. Minority persons are those who identify as Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, some other race or multiple races, or Hispanic/Latino of any race. The “non-minority” population includes those persons who identify as white and not Hispanic or Latino. The white, non-Hispanic population is no longer a “majority” in the Bay Area, but at 46% of the region’s population it remains the largest racial/ethnic group in terms of total population share (see Table 3-1, page 19).

LOW-INCOME

Defining individuals, households, populations, or communities as “low-income” is challenging. A person or a household can be “low-income” in the sense that they do not earn

enough money to meet a basic standard of living, or they can be “low-income” in relation to other people or households that earn more money. Either determination is subjective to some extent, which makes it more difficult to characterize the low-income population as a whole than, for example, the minority population. In this report, two different definitions of “low-income” are used. While they are not strictly equivalent, they both represent roughly the lowest 20 to 25% of the region’s population/households in terms of income.

Persons living below 200% of the Federal Poverty Level This definition is used in the poverty-concentration threshold to identify “communities of concern,” where at least 30% of residents have incomes below 200% of the federal poverty level. The population this definition represents is based on an **individual-level** determination of poverty status in relation family income, family size, and a basic standard of living defined by the Census Bureau each year. Poverty status is not forecast, since there is no regionally established method of accounting for changing standards of living; defining a basic standard of living implies the consumption of a wide variety of goods to meet one’s needs, and it is difficult to forecast the future costs of all these various goods. As a reference, for a single-person household 200% of the poverty level in 2007 was \$21,180. For a two-adult, two-child household, the 200% threshold was \$42,054. (See Table A14 in the Appendix for details). By way of comparison, a full-time worker earning California’s minimum wage would have earned \$15,600 in 2007.⁷

Households with Income Less Than \$40,000 The other low-income definition used in some of the equity indicators in this analysis is for **households** rather than individuals, and is based on household income level regardless of household size; ABAG does forecast the number of households by income group for the horizon year 2035, and thus it is the definition used in this report for forecast data for “low-income households” in the accessibility and affordability analyses. In addition, some indicators also account for a broader grouping of all low plus moderately low income households, creating a group of households earning less than \$75,000. Table 2-1 shows the income ranges and mean incomes, for both 2006 and 2035, for the region’s four income groups.

One exception to these thresholds is applied to the financial analysis of Plan investments, where due to limitations of data available for the analysis, low-income households are defined as those with an income less than \$25,000 (see Chapter 4).

⁷ Based on California’s minimum wage of \$7.50 per hour as of January 1, 2007. Beginning January 2008, California’s minimum wage rose to \$8.00 per hour. Some jurisdictions in the region have higher minimum wages, but generally speaking workers earning minimum wage will fall within MTC’s definition of “low-income” unless another household member is contributing a substantially higher income to the household.

Characteristics of MTC’s Four Income Groups in Inflation-Adjusted 2008 Dollars

Income Group	Household Income Range	Mean Income	
		2006	2035
Low	Less Than \$40,000	\$23,472	\$24,585
Moderate-Low	\$40,000-\$75,000	\$61,235	\$60,214
Moderate-High	\$75,000-\$125,000	\$100,857	\$97,167
High	Greater Than \$125,000	\$228,225	\$253,890

Source: ABAG Projections 2007

Table 2-1. Characteristics of MTC’s Four Income Groups

TRAVEL ANALYSIS ZONE (TAZ)

A Travel Analysis Zone (TAZ) is a unit of geography at roughly the neighborhood scale. The Bay Area comprises 1,454 such zones, for which socioeconomic (employment, households by income group) and travel characteristics (vehicle ownership, travel origins and destinations) are estimated to produce base year estimates for 2006 and horizon-year estimates for 2035 under various planning alternatives. TAZs range in size from several blocks in San Francisco’s financial district to much larger areas in low-density outlying areas of the region. Generally, they are similar in geographic extent to census tracts.

COMMUNITIES OF CONCERN

MTC defines communities that have concentrations of either minority or low-income residents (below 200% of the federal poverty level) as communities of concern for the purpose of analyzing regional equity.

Table 2-2 lists the 44 distinct communities in the region that meet MTC’s defined thresholds of having at least 70% minority or 30% low-income residents as of the 2000 Census (the most recent year for which demographic and socioeconomic data exist at these communities’ fine-grained level of geography).

Since it is not possible to forecast future concentrations of minority or low-income populations in the region, this analysis is limited to defining communities of concern only based on today’s conditions and then estimating and comparing conditions in these same communities in 2035. As such, this analysis addresses the question “What will change for today’s communities of concern under the Transportation 2035 Plan?” rather than “Where will communities of concern be located in the future?”

Table 2-2. Characteristics of the Region's 44 Communities of Concern

Co.	Community of Concern	2000 Population	% Low-Income	% Minority	Diversity Index*
1	SF Downtown / Chinatown / North Beach / Treasure Isl.	40,436	43.6%	68.5%	0.59
2	SF Tenderloin / Civic Center	36,589	53.5%	59.9%	0.86
3	SF South of Market	14,546	53.2%	65.1%	0.90
4	SF Western Addition / Haight-Fillmore	32,028	38.3%	54.0%	0.83
5	SF Inner Mission / Potrero Hill	53,579	40.9%	72.2%	0.76
6	SF Bayview / Hunters Point / Bayshore	73,979	33.9%	90.7%	0.84
7	SF Outer Mission / Crocker-Amazon / Ocean View	85,826	26.5%	80.9%	0.84
8	SM Daly City	110,391	16.7%	84.0%	0.77
9	SM South San Francisco / San Bruno	19,282	28.7%	78.7%	0.72
10	SM San Mateo	7,917	42.7%	87.8%	0.73
11	SM East Palo Alto / North Fair Oaks	67,765	40.7%	85.6%	0.70
12	SC Stanford / Mountain View	10,053	41.4%	58.3%	0.80
13	SC Alviso / Shoreline / Sunnyvale	14,615	19.9%	75.2%	0.79
14	SC Santa Clara	16,961	29.1%	56.7%	0.81
15	SC Central San Jose	489,174	28.7%	83.3%	0.78
16	SC South San Jose / Morgan Hill	11,809	29.6%	53.9%	0.67
17	SC Gilroy	17,859	42.5%	78.2%	0.49
18	SC Milpitas	54,458	14.0%	77.9%	0.74
19	Ala Fremont / Newark	45,167	15.3%	74.9%	0.79
20	Ala Hayward / Union City	142,861	25.2%	79.3%	0.89
21	Ala Ashland / Cherryland / San Leandro	39,911	30.1%	70.3%	0.91
22	Ala Fruitvale / East Oakland	217,212	48.6%	91.8%	0.84
23	Ala West / North Oakland	72,330	52.1%	83.5%	0.83
24	Ala Alameda	10,552	35.8%	67.3%	0.92
25	Ala Berkeley / Albany	61,100	46.0%	57.3%	0.89
26	CC Richmond	59,806	47.5%	87.7%	0.82
27	CC San Pablo / North Richmond	46,158	42.1%	85.2%	0.89
28	CC Hercules / Rodeo / Crockett	16,218	14.6%	68.9%	0.91
29	CC Martinez	1,651	38.4%	40.8%	0.70
30	CC Concord	23,112	45.2%	68.5%	0.76
31	CC Bay Point / Pittsburg / Antioch	70,865	38.2%	68.1%	0.87
32	CC Brentwood	8,321	30.5%	56.2%	0.60
33	Sol Vallejo	82,482	32.1%	75.2%	0.95
34	Sol Fairfield / Suisun City	43,237	41.7%	57.5%	0.89
35	Sol Vacaville	12,266	30.5%	44.4%	0.72
36	Sol Dixon	8,395	32.9%	51.6%	0.56
37	Nap Napa / American Canyon	35,469	35.8%	43.6%	0.60
38	Nap Calistoga	5,190	32.7%	43.9%	0.57
39	Son Central Sonoma Valley	9,227	36.1%	44.9%	0.53
40	Son Santa Rosa	57,389	39.9%	51.2%	0.70
41	Son Healdsburg	4,605	40.7%	48.4%	0.48
42	Son Guerneville / Monte Rio	8,185	35.7%	17.2%	0.40
43	Mar San Rafael Canal District	11,679	58.7%	83.9%	0.59
44	Mar Marin City	2,500	37.7%	67.5%	0.87
Communities of Concern TOTAL		2,253,155	34.5%	76.9%	0.91
Remainder of Bay Area TOTAL		4,530,607	13.8%	36.8%	0.69
Bay Area TOTAL		6,783,762	20.6%	50.1%	0.81

Source: Census 2000 Summary File 3 Tables P7 and P88

* Diversity Index ranges from a value of 0 (for a completely homogeneous population) to 1 (exactly equal distribution of five racial/ethnic categories: white/non-Hispanic, Hispanic/Latino, Black, Asian, and Other). The higher the value, the more evenly distributed each racial/ethnic group is within each geography.

Residents of all communities of concern together were 76.9% minority and 34.5% low-income in 2000. By comparison, the region as a whole in 2000 was 50.1% minority and 20.6% low-income. (At the region-wide level, for which MTC has more recent 2007 data available from the Census Bureau, these shares had grown to 54.5% minority and 22.2% low-income.)

As a whole, residents of communities of concern represented 33.2% of the region's 2000 population and 33.7% of the region's travel analysis zones. These totals include the entire populations living in communities of concern, including those who are non-minority and not defined as low-income. For the purposes of analyzing equity at a regional scale, this analysis compares all communities of concern to the remainder of the region's communities. Figure 2-1 shows the location of MTC's communities of concern within the region.

While the identification of communities of concern emphasizes regional **concentrations** of poverty, most residents of communities of concern (76.9% of the total) are **not** low-income. Moreover, nearly half of the region's low-income residents live **outside** communities of concern. In terms of 2000 population, 777,000 low-income people lived in communities of concern (55.4% of the region's total low-income population of 1.4 million), while 625,000 lived in the remainder of the region (44.6% of the region's total low-income population). This finding raises a relevant question as to what impacts of the Transportation 2035 Plan are being experienced by the remaining low-income population outside of communities of concern, a point this equity analysis attempts to address in several ways. First, accessibility and affordability measures are applied to low and moderately low income households throughout the region, before accessibility estimates are produced for communities of concern and the remainder of the region for comparison (further detail on the measurement of accessibility and affordability is provided in Chapter 4). Second, separate accessibility measures were produced by income level irrespective of geography (presented in Appendices B and C). Finally, many of the regional demographic and socioeconomic trends summarized in Chapter 3 present region-wide data for all low-income households.

The location of most of the region's communities of concern notably ring the San Francisco Bay's cities and inner suburbs, including where the region's road and transit networks are densest. Farther out in the region, locations of communities of concern become more scattered, with fewer connections to the region's transportation network.

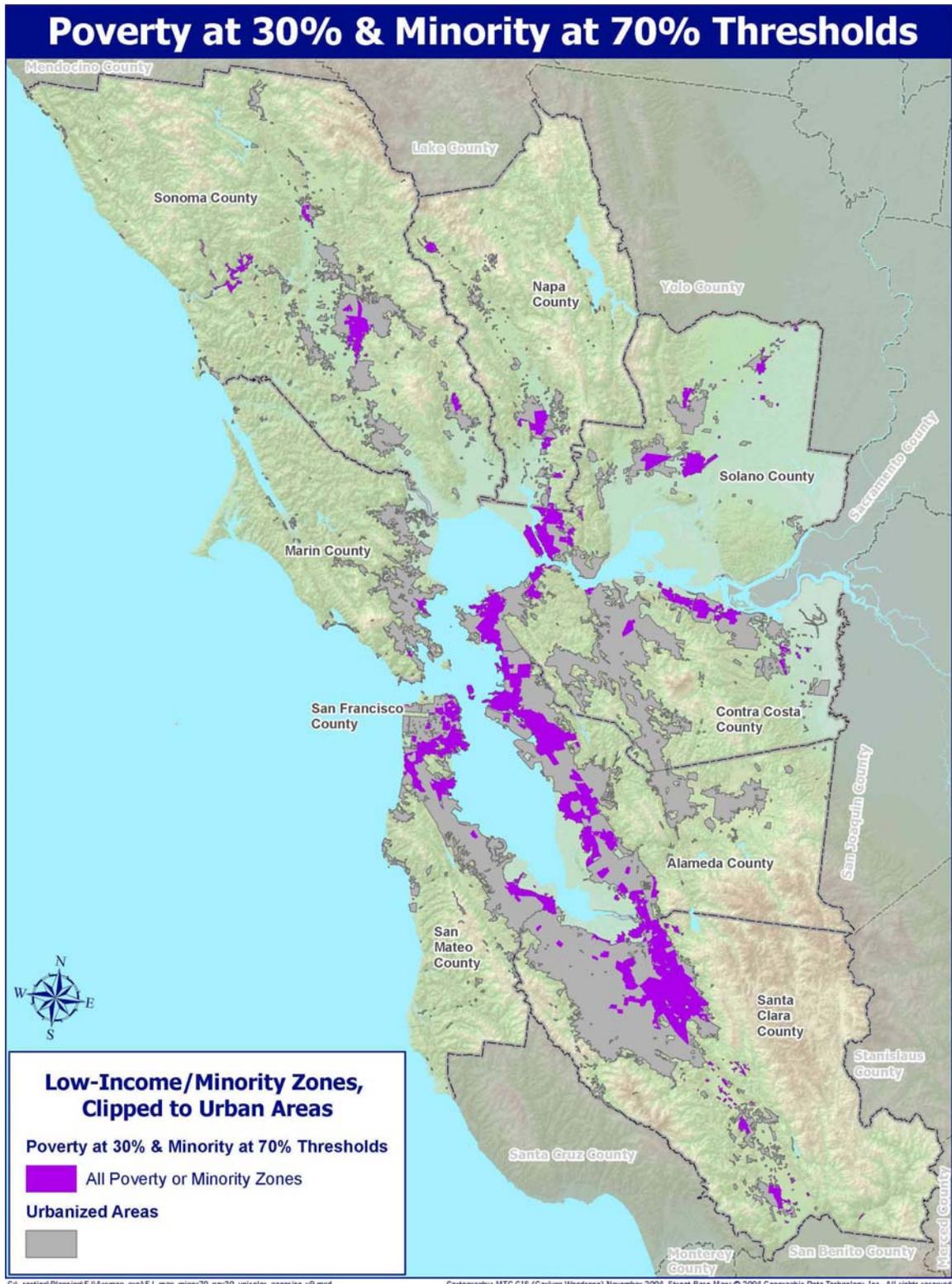


Figure 2-1. Location of Low-Income and Minority Communities of Concern in the Bay Area

2.2 Data Sources

This section describes the various data sources used to perform the Transportation 2035 Equity Analysis. Resources with further details about many of these are listed in the References section at the end of this report.

DECENNIAL CENSUS

The decennial Census provides a complete count of all persons in the United States, including age and race/ethnicity, every 10 years. In addition, past Censuses have surveyed one in six households to produce sample socioeconomic characteristics such as household income, poverty status, vehicle availability, employment characteristics, and commute mode, which are available down to the block group level of geography. As explained in the preceding section, data from the 2000 Census was used to identify MTC's low-income and minority communities of concern; it remains the most recent Census data available at the census tract/TAZ (i.e. neighborhood) level.

AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) is a newer Census Bureau data product, which replaces the “long form” questionnaire used in previous decennial Censuses to sample household socioeconomic characteristics. Whereas the decennial Census long-form data was previously released once every 10 years, the American Community Survey data is an ongoing survey, updated annually. Currently, data is available for larger geographic areas of more than 65,000 population, including 2005, 2006, and 2007 data for all nine Bay Area counties and the region as a whole. The five-year accumulation of ACS data for 2005–2009 will be released at the census tract and block group level perhaps by fall 2010. This will be the soonest that updated socioeconomic data for people and households in designated communities of concern will be available.

BAY AREA TRAVEL SURVEY (BATS)

The Bay Area Travel Survey is MTC's periodic regional household travel survey, the most recent of which was conducted in 2000. BATS2000 is an activity-based travel survey that collected information on all in-home and out-of-home activities, including all trips, over a two-day period for more than 15,000 Bay Area households. The survey provides detailed information on many trip characteristics such as trip purpose, mode, origins and destinations, as well as household characteristics.

MTC TRANSIT PASSENGER DEMOGRAPHIC SURVEY

In 2006 MTC conducted a comprehensive survey of all Bay Area transit operators to collect consistent demographic and socioeconomic data for all the region's transit riders. Data

collected included race/ethnicity, age, fare payment information, household income, and vehicle availability. Results for this survey were used in the financial analysis of RTP investments to determine transit-spending benefits to low-income households based on these households' share of transit use in the region.

ABAG PROJECTIONS 2007

Every two years, the Association of Bay Area Governments releases an update to its *Projections* series of population, household, and employment forecasts for the nine-county Bay Area, which reflects the most up-to-date assumptions about the location and density of future growth. MTC's Transportation 2035 Plan utilizes forecasts from *Projections 2007* as the basis for modeling future travel demand in the horizon year 2035.

MTC FORECASTS

MTC uses travel modeling and forecasting to reflect base-year travel patterns and simulate future-year travel for 2035. The forecasting system is used to estimate and forecast automobile ownership in communities of concern. It is also used to assess accessibility of Bay Area communities to employment and other household activities by auto and transit, as well as vehicle travel and emissions data, in the base and forecast years.

2.3 Transportation 2035 Alternatives

This equity analysis evaluates the Transportation 2035 Plan (the "Project") and several alternatives established in accordance with the California Environmental Quality Act (CEQA). These and other alternatives are evaluated in the Transportation 2035 Draft Environmental Impact Report (EIR) as required by CEQA. Additional information about the alternatives is included in the Draft EIR, Chapter 3.⁸ While the main focus of this equity analysis is on the comparison of the Project to the "No Project" alternative, other alternatives have also been included to better understand the potential equity implications of alternative policy scenarios besides just investments in transportation infrastructure.

PROJECT: TRANSPORTATION 2035 PLAN

The Transportation 2035 Plan represents a strategic investment plan to improve system performance, accessibility, and mobility for Bay Area travelers over the next 25 years. As required by state and federal planning regulations, the Transportation 2035 Plan is financially constrained in that it includes a set of transportation projects and programs that would be funded through existing and future revenues projected to be reasonably available to the region over the 25-year horizon of the plan. A total of \$226 billion in revenues is

⁸ See http://www.mtc.ca.gov/planning/2035_plan/EIR.htm.

available for the financially constrained Transportation 2035 Plan. Moreover, the Project also includes an unconstrained financial element that identifies a set of illustrative transportation projects and programs that would be shifted into the financially constrained element if additional resources beyond those identified in the financial plan were to become available. ABAG's *Projections 2007* serves as the underlying demographic and land use assumptions for the Transportation 2035 Project.

NO PROJECT ALTERNATIVE

The No Project Alternative, required by CEQA, addresses the effect of **not implementing the Transportation 2035 Plan**. This includes a set of transportation projects and programs that are in advanced planning stages and slated to go forward since they have full funding commitments, either because they are identified in the FY 2009 federal Transportation Improvement Program, fully funded by voter-authorized local sales taxes, or fully funded through other committed funds defined by statute or MTC policy. ABAG's *Projections 2007* serves as the underlying demographic and land use assumptions for this alternative.

HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS PLUS PRICING STRATEGIES

This alternative (hereafter referred to as "Pricing") is financially constrained in that it represents only the set of transportation projects and programs that would be funded through revenues projected to be reasonably available over the 25-year time horizon of Transportation 2035. Unlike the proposed Project, this alternative places its uncommitted discretionary investment emphasis almost entirely to **system maintenance and efficiency** projects that support plan goals by (1) reducing shortfalls for transit and local roadway maintenance; (2) improving walkability, bicycling, transit access, and carpooling and ridesharing; (3) helping local jurisdictions to plan and build housing near transit; and (4) implementing public education and outreach programs to raise awareness and facilitate behavior changes that help the region meet its climate protection goal. The result of this emphasis is that this alternative excludes all expansion projects, including the Regional HOT Network and the transit and roadway expansion projects. Eliminating the contribution of the Regional HOT Network's projected net revenue of \$6.1 billion leaves \$26 billion in uncommitted discretionary funds for this alternative (as opposed to \$32 billion under the proposed Project) that can be directed to:

- \$11 billion of the \$21 billion transit capital maintenance shortfall (a \$4.6 billion increase from the proposed Project)
- \$9 billion of the \$18 billion local roadway shortfall (a \$2 billion increase)
- \$3 billion to the Transportation for Livable Communities Program for planning and capital projects to improve pedestrian, bicycle, and transit access (a \$900 million increase)
- \$1.3 billion to the Regional Bicycle Program (a \$300 million increase)

- \$900 million to the regional Transportation Climate Action Campaign (a \$500 million increase)
- \$1.1 billion to the Lifeline Transportation Program (a \$400 million increase in addition to the \$300 million previously committed in the proposed Project).

On top of the maintenance- and efficiency-heavy project definition described above, this alternative also examines the level of impact that additional user-based pricing strategies could have on the performance of the infrastructure investments. The pricing strategies are intended to induce changes in travel behavior by **increasing the cost of driving**. Strategies include a carbon tax or tax on vehicle-miles driven, fees for using congested freeways during peak hours, and increased parking charges. The cumulative effects of these pricing strategies are a substantial increase in transportation costs, but also benefits from reducing CO₂ and other emissions. ABAG's *Projections 2007* serves as the underlying demographic and land use assumptions for this alternative.

HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS PLUS LAND USE STRATEGIES

This alternative (hereafter referred to as “Land Use”) reflects the same maintenance- and efficiency-heavy project definition as described above, but instead of adding pricing strategies it evaluates the level of impact that an alternative land use forecast beyond that in the *Projections 2007* assumptions could have on the performance of the infrastructure investment. ABAG staff produced this alternative land use forecast with the objective of balancing jobs and housing and targeting growth in existing communities and near transit. Compared to *Projections 2007*, this forecast reflects **considerable shifts in regional growth to existing employment and housing centers, areas projected to have either household or employment growth, and areas with existing and/or planned transit.**

This alternative assumes that the regional planning agencies of ABAG, the Bay Area Air Quality Management District (BAAQMD), the Bay Conservation and Development Commission (BCDC), and MTC will collaborate to promote and achieve more focused urban growth than estimated in *Projections 2007*, in part through existing and planned programs and improvements contemplated by this alternative. Specific policy approaches have not been selected; however, some possible examples of regional policy approaches and implementation mechanisms include:

- Increasing public awareness of the impacts of travel and locational decisions
- Continuing to coordinate with local governments on land use decisions and parking policies and standards that impact transportation investments and vice versa
- Providing financial incentives to support Priority Development Areas
- Expanding MTC's Transit Oriented Development Policy to include minimum employment densities and regional transit centers.

2.4 Equity Measures

Equity in the Transportation 2035 Plan is evaluated via several measures, or indicators, which characterize the distribution of benefits and burdens in implementing the Plan.

Results are produced two ways:

- Analysis of the Plan's financial investments based on low-income households' share of system usage
- Estimates of various transportation outcomes of the Plan (such as accessibility or affordability) produced by MTC's travel demand model.

In order to obtain the modeled results of the Equity Analysis, estimates are produced at the neighborhood (TAZ) level of certain socioeconomic and travel characteristics for both a base year (2006) as well as different 2035 forecasts. Socioeconomic characteristics include measures such as population, employment, and income. Travel characteristics include travel destinations (based on land use factors), vehicle ownership, and travel time.

The basic methodology for assessing the equity impacts of the Transportation 2035 Plan in terms of outcomes is:

1. Identify each TAZ as being in one of the 44 communities of concern or the remainder of the region.
2. Extract indicator variables for both communities of concern and remainder of Bay Area communities for each alternative described in the preceding section.
3. Evaluate results to assess:
 - Whether the Project has a beneficial impact on communities of concern, and
 - Whether communities of concern receive similar or greater benefit compared to the remainder of the region under the Transportation 2035 Plan, relative to the No Project alternative.

Five equity measures are evaluated in this analysis:

- Financial analysis of RTP expenditures
- Access to low-income jobs by auto and transit
- Access to non-work activities by auto and transit
- Emissions
- Affordability (a test measure)

These indicators were selected based on their use in previous RTP equity analyses (such as accessibility), refined from past analyses, or, in the case of the affordability measure, represent a new and experimental test measure. There are many potential measures by which equity can be evaluated. These five indicators represent the combined effort of MTC staff, MTC's Minority Citizens Advisory Committee, and other stakeholders to identify which

measures had more relevance to the region’s low-income and minority communities of concern. Details about how each measure are estimated is provided in Chapter 4.

3 REGIONAL TRENDS

Chapter Highlights

- **The region’s minority population will continue to grow in number and share, with Hispanic/Latino and Asian populations growing fastest.**
- **Growth in the low-income population outpaced that of the non-low-income population between 2000 and 2007. However, ABAG forecasts that there will be 90,000 fewer low-income households in the region in 2035 compared to 2006.**
- **Access to autos increased between 2000 and 2007, notably among low-income and minority households. However, a larger share households is forecast to have zero vehicles in 2035.**
- **On average, low-income households spend 26.7% of household income on transportation costs, about twice the regional average.**

The purpose of this section is to highlight key recent regional demographic and socioeconomic trends in the region that are relevant to understanding equity. While the region’s low-income and minority communities of concern were defined at a fine-grained geographic level as of 2000 Census data, the Census Bureau has since released more recent data for larger geographies in the region that help identify broader regional trends. In addition, where available, relevant demographic and socioeconomic forecast data is provided for the horizon year 2035.⁹ Future-year data are forecast based on the best set of planning assumptions available today, and are generally based on the *Projections 2007* forecasts produced for the region by the Association of Bay Area Governments. Forecasts of automobile ownership are produced by MTC. Appendix A provides more detailed breakdowns of these regional trends.

3.1 Increasing Minority Population

The Bay Area continues to become a more diverse region, and this trend is expected to continue into the future, as shown in Table 3-1. Today, slightly more than half the region’s population of roughly 7 million belongs to a minority racial or ethnic group. The population of Hispanic or Latino origin is growing fastest, followed by Asians/Pacific Islanders.

Over the next 25 years, the region’s population is forecast to grow to approximately 9 million, a 30 percent increase from today’s population of roughly 7 million. By 2035, roughly two-thirds of the region’s projected population of 9 million will be members of a minority

⁹ For more discussion of regional trends forecast for 2035, see Chapter 2 of the Transportation 2035 Plan.

group. These trends underscore the importance of considering the needs of a diverse population in regional transportation planning.

Bay Area Population and Share by Race/Ethnicity
2000, 2007, 2035

	2000	2007	2035
White Non-Hispanic	50%	46%	32%
Hispanic/Latino (any race)	19%	22%	33%
Asian or Pacific Islander	19%	22%	24%
Black	7%	7%	7%
Other/Multiple Races	4%	3%	4%
Total Population	6,783,760	6,958,473	9,031,498

Source: U.S. Census Bureau and ABAG Projections 2007

Table 3-1. Bay Area Population Shares by Race/Ethnicity: 2000, 2007, 2035

3.2 Rise in and Decentralization of Low-Income Population

As noted in Chapter 2, MTC defines the regional low-income population as being those people below 200% of the federal government’s poverty thresholds. The Census Bureau used to gather and release poverty population data once every ten years in the decennial Census. However, with the introduction of annual estimates released from the American Community Survey, it is now possible to obtain an annual update of the regional low-income population.¹⁰ The most recent estimates were released for 2007.

Table 3-2 shows the regional population broken out by poverty level between 1990 and 2007. Over time, both the number and share of the region’s low-income population below 200% of poverty has grown, similar to nationwide trends during the same period. Since 2000, the region’s low-income population increased by 146,000, while the non-low-income population increased by only 27,000. In other words, nearly 85% of the region’s total net population increase between 2000 and 2007 was accounted for by a net increase of low-income residents. As of 2007, 1.5 million of the region’s residents, or 22.2% of the population, fall below the low-income threshold used in this analysis of 200% of federal poverty level.

¹⁰ Currently, estimates are available for areas of population 20,000 or greater. MTC expects updated data for all areas of the region, including all communities of concern, to be available perhaps in late 2010. See “American Community Survey 2007: San Francisco Bay Area: Data Highlights” (http://www.mtc.ca.gov/maps_and_data/datamart/census/ACS2007_DataHighlights.pdf) for detailed breakouts by county.

Bay Area Population Share by Poverty Level
1990 - 2007

	1990	2000	2006	2007	Change 2000-2007
Below 200% Poverty	1,236,998	1,374,211	1,567,014	1,520,308	146,097
% of Total	21.0%	20.6%	23.0%	22.2%	
Above 200% Poverty	4,643,889	5,287,329	5,238,807	5,314,097	26,768
% of Total	79.0%	79.4%	77.0%	77.8%	
Total	5,880,887	6,661,540	6,805,821	6,834,405	172,865

Source: U.S. Census Bureau

Table 3-2. Bay Area Population by Poverty Level: 1990-2007

Another notable trend in addition to the overall growth in low-income population is the decentralization of low-income population out of the region’s largest cities of San Francisco, Oakland, and San Jose. According to the Census Bureau, in 1990, 43% of the region’s low-income population lived in one of these three cities. By 2000, this figure had fallen to 39%, and by 2006, 37%. As a greater share of low-income people move away from the cities where the region’s densest transit networks are located, it is worth asking how and whether the region’s low-income residents are meeting their access and mobility needs. Some low-income households are likely taking on more automobiles (and hence greater transportation expenses) in order to optimize their choice of residential location, while others may be sacrificing accessibility in locations with less transit service.

Though the recent trend has been toward an increase in the region’s low-income population, ABAG projects fewer low-income households in the region by 2035. Table 3-3 shows that the Bay Area’s total number of low-income households (all households earning less than \$40,000 in today’s dollars, regardless of household size), declining from 622,622 households (a 24% share of the region’s total households) in 2006 to 532,333 households (a 16% share) in 2035. These totals are also broken down further into communities of concern and the remainder of the region, although this distinction is based on current location of concentrated minority and low-income populations as of 2000 (ABAG does not forecast minority populations at the community level, or poverty population).

Households by Income Group by Community of Concern

		2006		2035	
		Number	Share	Number	Share
Communities of Concern	Low	285,759	38%	272,035	26%
	Moderate-Low	174,261	23%	241,750	23%
	Moderate-High	173,777	23%	281,151	27%
	High	123,396	16%	234,888	23%
	Total	757,193	100%	1,029,824	100%
Remainder of Bay Area	Low	336,863	18%	260,298	12%
	Moderate-Low	341,915	18%	381,437	17%
	Moderate-High	482,418	26%	629,648	28%
	High	687,363	37%	991,314	44%
	Total	1,848,559	100%	2,262,697	100%
Bay Area Total	Low	622,622	24%	532,333	16%
	Moderate-Low	516,176	20%	623,187	19%
	Moderate-High	656,195	25%	910,799	28%
	High	810,759	31%	1,226,202	37%
	Total	2,605,752	100%	3,292,521	100%

Source: MTC estimates based on ABAG Projections 2007

Table 3-3. Households by Income Group by Community of Concern: 2006-2035

3.3 Increased Access to Autos

Regionally, access to autos rose between 2000 and 2006. Both the number and the share of zero-vehicle households in the region declined, as shown in Figure 3-1, which also shows the number and share of zero vehicle households in the region beginning in 1980 and projected to 2035. Despite a longtime downward trend in the share of households without access to any vehicles, by 2035 this trend is forecast to reverse, with a slightly greater share of households having no access to a vehicle.

This increase in access to automobiles between 2000 and 2006 is also seen across numerous regional subgroups analyzed, including both minority and low-income households. While minority households and low-income households are still more likely not to have access to a vehicle than the regional average, the shares of these households that lack access to a car fell between 2000 and 2006, as shown in Table 3-4.

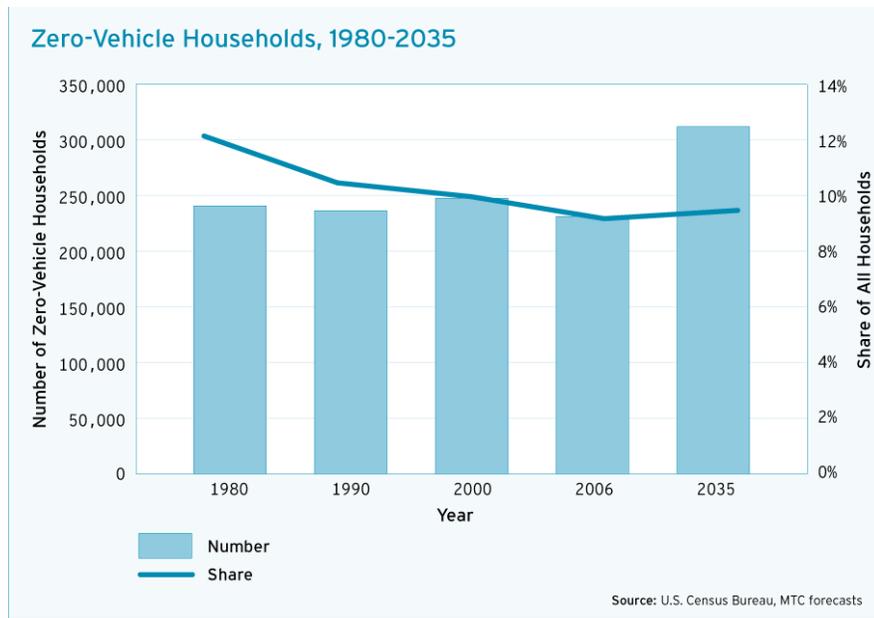


Figure 3-1. Zero-Vehicle Households, 1980-2035

		2000	2006
Minority Households	Zero Vehicles	13.2%	11.4%
	1+ Vehicles	86.8%	88.6%
Low-Income Households	Zero Vehicles	27.4%	24.6%
	1+ Vehicles	72.6%	75.4%
All Bay Area Households	Zero Vehicles	10.0%	9.2%
	1+ Vehicles	90.0%	90.8%

Table 3-4. Share of Households by Vehicle Availability, 2000-2006

Another view of auto access breaks regional households into three groups: those with access to zero vehicles, considered to meet the traditional definition of “transit dependent”; those with fewer vehicles than adult household members, who could be considered “partially” transit dependent (for example, in a household with three adults and one vehicle, if one adult takes the vehicle to work the other adults must find other means to meet their mobility needs); and those with at least as many vehicles as adult household members, considered to have “sufficient” vehicles for meeting mobility needs. Table 3-5 shows that between 2000 and 2006, more households in the region attained full “vehicle sufficiency” in terms of having at least as many vehicles available as adults in the household, while the number and share of households that are fully or partially transit dependent declined.

Nevertheless, despite overall trends toward increased auto access, these figures provide a slightly different view of the traditional definition of “transit dependency,” that as of 2006 up to 27.4% of the region’s households are likely to require means other than the private automobile, at least sometimes, to meet their mobility needs.

		2000	2006
Zero Vehicles (Fully Transit Dependent)	Number	246,413	232,900
	% of Total	10.0%	9.3%
Fewer Vehicles Than Adults (Partially Transit Dependent)	Number	537,729	451,620
	% of Total	21.8%	18.1%
As Many Vehicles as Adults (Sufficient Vehicles)	Number	1,681,834	1,815,663
	% of Total	68.2%	72.6%

Source: U.S. Census Bureau

Table 3-5. Households by Transit Dependent Status (Adult Vehicle Sufficiency), 2000-2006

These trends add perspective to those identified in preceding section on growth and decentralization of low-income households since 2000. Though the number and share of low-income households has increased, at the same time more low-income households are taking on vehicle ownership. Personal vehicles provide high levels of access and mobility, but can also come at a relatively higher cost to lower-income households. These implications on affordability are explored further in the following section.

3.4 Housing and Transportation Affordability Challenges

As noted in Chapter 1, MTC selected housing and transportation affordability (that is, the combined cost of housing and transportation as a share of income) as a key measure of the Transportation 2035 Plan’s performance toward the goal of equity. This section examines current and recent trends related to affordability.

With respect to housing affordability, a key trend in the region is the rising share of households that are considered cost burdened. According to definitions used by the Census Bureau and other federal agencies, a household that spends more than 30% of income on housing is considered “burdened” by these costs. The Bay Area is known for having high housing costs, and Figure 3-2 shows how the share of households falling into the “burdened” category has risen since 2000, most notably among homeowners, whose share of cost-

burdened households continued to rise even as the share of cost-burdened renter households began to level off in 2004.

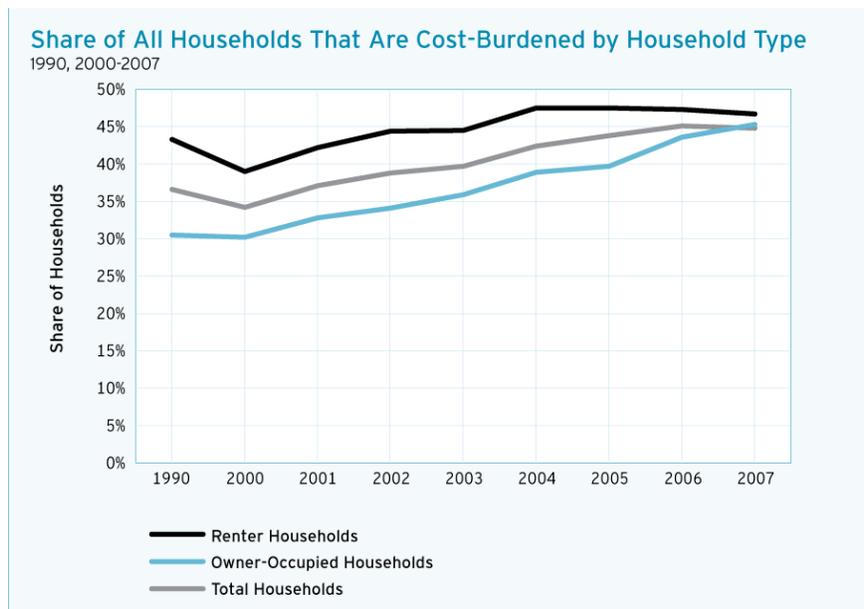


Figure 3-2. Share of Households That Are Cost-Burdened by Household Type: 1990, 2000-2007

While these housing affordability trends over time are for households of all income levels in the region, it is also helpful to examine affordability challenges faced by households of different income groups. As part of the affordability test measure evaluated in this analysis, MTC created estimates by income group of housing and transportation costs as a share of income for the year 2006, based on analysis of Census data and ABAG estimates of households and income, and using the regional travel model to estimate transportation costs.

According to MTC’s estimates for 2006, low-income households earning less than \$40,000 had an average income of \$23,472 and spent an average of 50.3% of income on housing costs (\$11,812 per year, or \$984 per month). Obviously, this average housing cost as a share of income for low-income households is far higher than the typical 30% guideline for housing affordability. When low-income households’ transportation costs are added to housing costs, as shown in Figure 3-3, these costs combined climb to 77.0% of average income. Low-income households’ housing and transportation costs as a share of income are more than regional average share of 36.5% for all households.

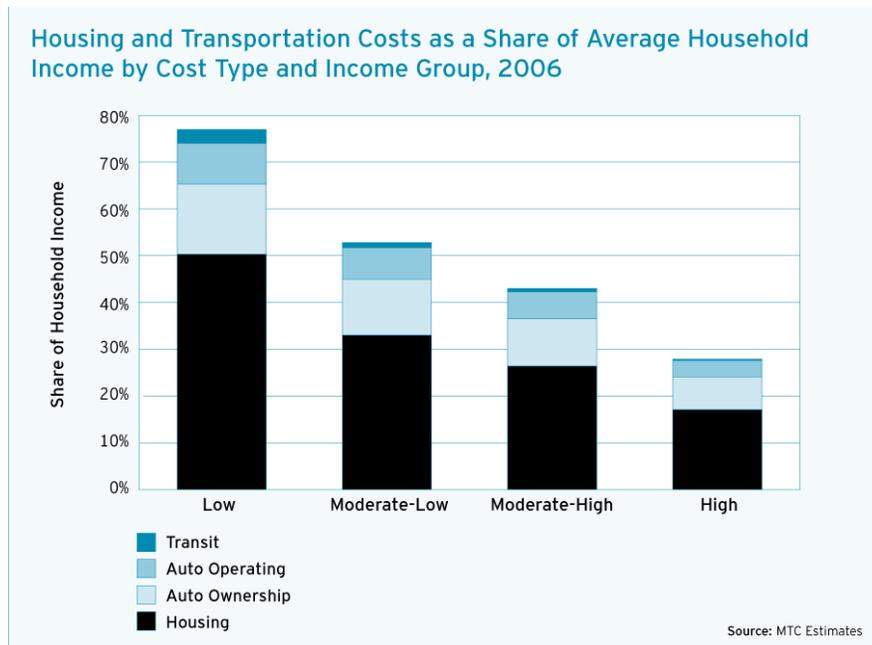


Figure 3-3. Housing and Transportation Costs as a Share of Average Household Income by Cost Type and Income Group: 2006

Figure 3-3 also shows that auto-related expenses, particularly auto ownership costs, are the greatest transportation-related cost to all households, including low-income households. These shares by income group are regional averages, with estimated transportation costs most affected by the number of household vehicles owned and the distance between home and work. Given that overall density levels can affect the need to own one or more automobiles as well as the average distance traveled to work, MTC also analyzed transportation costs as a share of income by density level.

Figure 3-4 shows how transportation costs generally rise with lower densities, except for the highest-income households (whose transportation costs as a share of income are relatively flat), and low-income households, whose highest transportation costs as a share of income is in urban and dense-suburban areas. These differences among low-income households are due as much to transportation costs rising at lower densities as they are accounted for lower average incomes in higher-density urban and dense-suburban areas (see Table A11 in Appendix A for additional details).

Taken together, these housing and transportation affordability trends paint a challenging picture for the region's low-income households in particular. Figure 3-3 shows that the region's moderately low income households (with an average income of \$61,000) spend an average of 53.1% of income on housing and transportation combined, while low-income households (with an average income of \$23,000) spend almost that much just on housing.

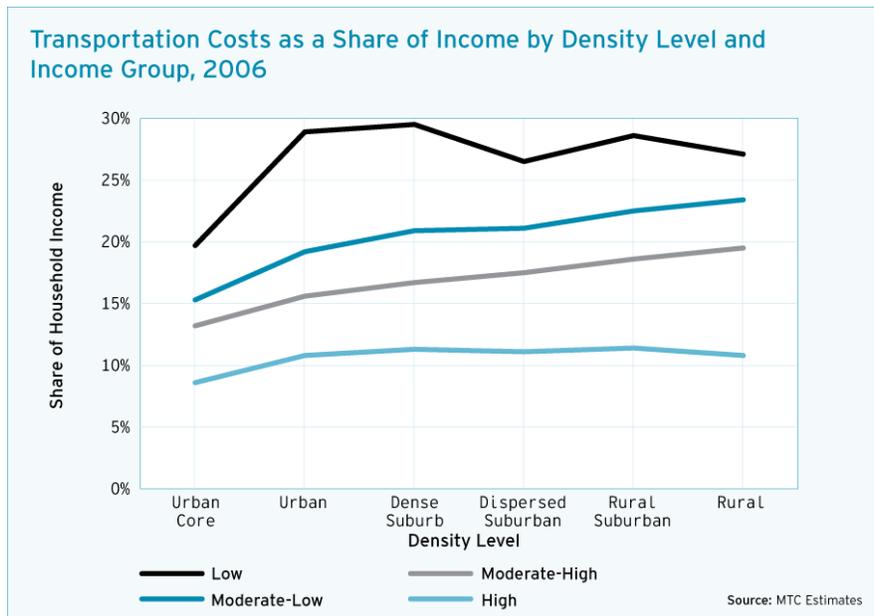


Figure 3-4. Transportation Costs as a Share of Income by Density Level and Income Group: 2006

Additional transportation cost estimates by cost type, by county, and by density level are provided in Appendix A. More details about housing and transportation affordability in the context of the Transportation 2035 Plan is provided in the detailed equity analysis results in the following chapter.

4 ANALYSIS RESULTS

Chapter Highlights

- **The financial analysis indicates greater expenditures made per low-income household than for other households, largely due to the Plan’s heavy investment in the transit system and transit maintenance and operations in particular.**
- **Overall, communities of concern have greater accessibility to jobs and other activities by both auto and transit than the remainder of the region. However, communities of concern have greater density of mobile source air toxics emissions than the remainder of the region, and housing and transportation costs consume a greater proportion of household income in communities of concern than the remainder of the region.**
- **Most forecasted indicators show similar or greater benefit accruing to communities of concern than the remainder of the region under the Transportation 2035 Plan relative to the No Project scenario. An exception is access to low-income jobs in 30 minutes by transit.**

This section provides the results of the equity analysis, summarized for each equity indicator. Each indicator is explained in terms of how estimates are produced for 2006 and all 2035 alternatives. Then the results are presented and interpreted in the context of the long-range impacts of the Plan on low-income households (in the financial analysis) or communities of concern (in the distributional analysis) and the remainder of the region.

4.1 Financial Analysis

The purpose of the financial analysis is to compare the allocation of Transportation 2035 expenditures between low-income households and all other households.¹¹ The key question addressed is: “Are low-income households sharing equitably in the Plan’s financial investments?” To answer this question, the analysis proceeds as follows:

1. Separate Transportation 2035 investments into two categories: transit and road/highway expenditures, and two sub-categories for operations/maintenance and expansion (Figure 4-1).
2. Allocate expenditures in each category to low-income and other households according to each groups’ usage share of each mode, roads and transit (Figure 4-2).
3. Sum the investments in all categories assigned to low-income households and to all other households based on each group’s usage share of each mode. Compute expenditures per household based on the number of households in each income group in 2006 (Table 4-1).

¹¹ For details on financial assumptions for the Transportation 2035 Plan, see Chapter 3 of the Plan document. Risk contingency is not included in this analysis.

Figure 4-1 shows the breakdown of Transportation 2035 expenditures by mode (transit vs. roads/highways) and expenditure type (maintenance/operations vs. expansion). More than half of the Plan’s expenditures go to maintaining the region’s existing transit system, with 64% of the Plan’s funding going to transit in total. The remaining 34% of Plan expenditures are dedicated to the road and highway network, again mostly toward operations and maintenance.

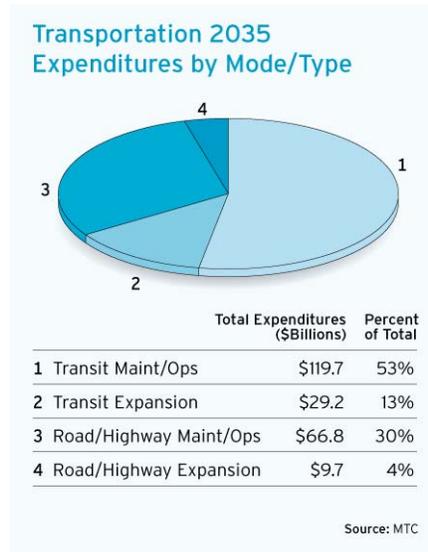


Figure 4-1. Transportation 2035 Expenditures by Mode/Type

In order to allocate these expenditures as benefits either to low-income households or to other households in the region, we must analyze what share of each mode (transit and roads/highways) low-income households utilize. For this analysis, low-income households are defined as households earning \$25,000 or less, which comprise 18% of the region’s lowest-income households.¹² Figure 4-2 illustrates this breakdown, showing that low-income households are a far greater share of transit users overall (26.7%) than roadway users (2.4%). Low-income households’ share of roadway usage is estimated as these households’ share of the region’s total vehicle miles traveled (VMT).

Next, Transportation 2035 expenditures as shown in Figure 4-1 are allocated to either low-income households or all other households, based on each income group’s usage share of each mode. Table 4-1 shows how the Transportation 2035 investments are allocated to households on the basis of income group. That is, 26.7% of the \$119.7 billion spent on transit maintenance and operations, or \$31.9 billion, is allocated as a benefit to low-income households based on their share of usage, with the remaining share of \$87.8 billion allocated

¹² This income threshold is used because of limitations of available breakpoints for household-income variables across the numerous data sources required to carry out this analysis. The \$25,000 cutoff is the only one readily available from the Census Bureau as well as MTC’s Bay Area Travel Survey and Transit Passenger Demographic Survey. Other analyses used in this report are not similarly constrained and so use low-income definitions described in Chapter 2.

to all other households. Finally, the share of each expenditure type is divided by the regional number of low-income or other households in 2006, to produce per-household expenditures by mode and purpose.

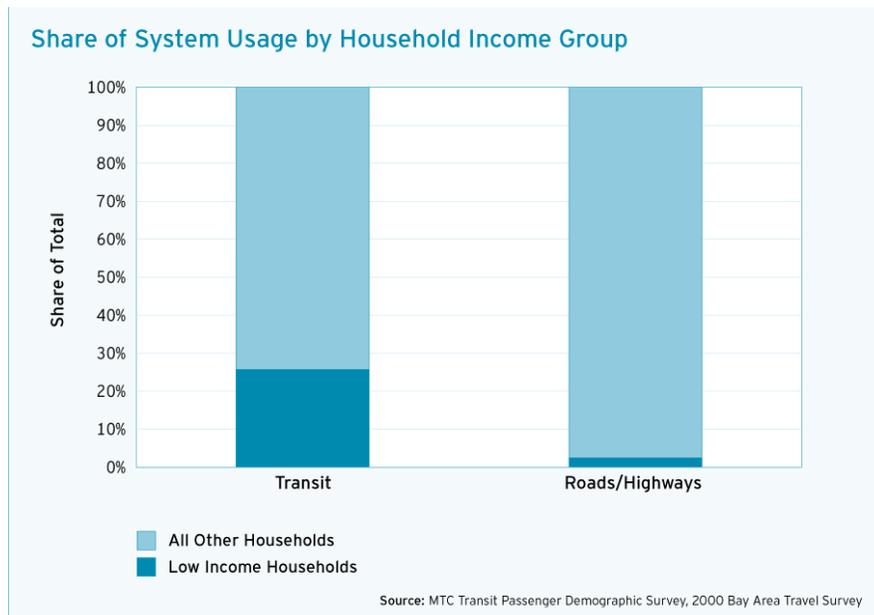


Figure 4-2. Share of Low-Income Households’ Use of Transit and Roads/Highways

T2035 Expenditures (\$Billions)	ALL Households	Low Income Households Share	ALL Other Households Share
Transit Maintenance/Ops	\$119.7	\$31.9	\$87.8
Transit Expansion	\$29.2	\$7.8	\$21.4
Transit Subtotal	\$148.9	\$39.7	\$109.2
Road/Highway Maintenance/Ops	\$66.8	\$1.1	\$65.7
Road/Highway Expansion	\$9.7	\$0.2	\$9.4
Road/Highway Subtotal	\$76.4	\$1.3	\$75.1
Total T2035 Expenditures	\$225.3	\$41.0	\$184.3

	Total	Low-Income	All Other
Number of Households (2006)	2,468,024	436,554	2,031,470

Expenditures per Household (\$000s)	ALL Households	Low Income Households	ALL Other Households
Transit Maintenance/Ops	\$48.5	\$73.0	\$43.2
Transit Expansion	\$11.8	\$17.9	\$10.5
Transit Subtotal	\$60.3	\$90.9	\$53.7
Road/Highway Maintenance/Ops	\$27.1	\$2.5	\$32.3
Road/Highway Expansion	\$3.9	\$0.5	\$4.6
Road/Highway Subtotal	\$31.0	\$3.0	\$37.0
Total	\$91.3	\$93.9	\$90.7

Source: MTC Draft Transportation 2035 Plan and 2006 American Community Survey

Table 4-1. Transportation 2035 Expenditures by Mode/Type and Household Income Group

Overall, this analysis suggests how the Transportation 2035 Plan’s major investments in transit, which is proportionately utilized more heavily by low-income households, results in a greater overall per-household expenditure for low-income households (\$93,900 total per household over 25 years) than other households in the region (\$90,700 per household over 25 years). On the other hand, this analysis also shows the extent to which road and highway investments appear to disproportionately benefit non-low-income households, because low-income households represent such a small proportion of total road/highway usage in the region in terms of VMT.

As a regional-scale, program-level analysis, this assessment is quite coarse, and has several limitations. Particularly with respect to assigning benefit from transit expansion projects to low-income households, the question arises of what kinds of services are being added, and whether the services ultimately offered would be affordable to low-income patrons or serve the destinations they need.¹³ This analysis is limited to assuming that existing operator demographics apply to expansion projects, since current demographic surveys of agency ridership do not include future riders who will be attracted to the areas served by these expansions either as origins and destinations. Moreover, the roadway-usage share doesn’t account for the fact that most of the region’s transit vehicles share roads and highways with private automobiles; obviously, roads in a poor state of repair would have negative ramifications for most transit systems and their users. Conversely, investments in local road maintenance and rehabilitation has some benefit to bus users not accounted for in this analysis.

Given these limitations, this analysis attempts to take a relatively conservative approach to assigning benefit to low-income households. Even with such an approach, there does not appear to be a systematic disbenefit to low-income households based on the Transportation 2035 Plan’s overall strategy of investing heavily in transit operations and maintenance.

4.2 Access to Low-Income Jobs

The ability to access employment is paramount to economic opportunity and productivity. The purpose of this indicator is to evaluate (1) whether the Transportation 2035 Plan offers gains in job accessibility to communities of concern relative to the No Project scenario and (2) whether the distribution of accessibility benefit is equitable between communities of concern and the remainder of the Bay Area.

¹³ Transit expansion projects include those funded under MTC’s Regional Transit Expansion Program, outlined in MTC Resolution 3434, as well as smaller expansion projects such as bus and BRT projects not covered under Resolution 3434.

This indicator measures for each alternative the total number of low-income jobs that can be accessed within 30 minutes' door-to-door travel time by both the AM-peak period congested highway network and the AM-peak period walk-access transit network. Estimates are produced for each travel analysis zone-of-residence, then aggregated to all communities of concern or the remainder of the region. The aggregate results produce averages for all communities of concern and the remainder of the region, weighted by the number of low and moderately low income households in each zone-of-residence. Year 2035 estimates are based on ABAG's projections of the number and residential location of low and moderately low income households, and Census 2000 data on location of work by workers' income level.

For this indicator, "low-income jobs" are defined as those jobs held by workers in low or moderately low income households (households with incomes less than \$75,000 in current dollars). No other assumptions can reliably be made about what kinds of jobs these are, for example with respect to skill level, educational requirements, job security, or advancement opportunities. While these are all important considerations, for the purposes of a long-range forecast the income-match is the best available proxy of whether these employment opportunities are attainable for workers in lower-income households.

The figures represented in this indicator are a weighted average of the total number of low-income jobs accessible from either all zones in communities of concern or all zones in the remainder of the region. Because the figures are weighted by number of low-income residents in each zone, a higher number means low-income households are able to access a greater number of low-income jobs than if the number were lower. Notably, this measure also accounts for accessibility by low-income households throughout the entire region, roughly half of whom live outside communities of concern (see Table 3-3, page 21). More detailed regional breakdowns of accessibility results by income level and geography are listed in Appendix B.

RESULTS: ACCESS BY AUTO

Access by auto to low-income jobs within 30 minutes for each alternative is shown in Figure 4-3. Similar to previous RTP equity analysis findings, low-income and minority communities of concern have overall higher levels of accessibility than the remainder of the region, both in the base year and under each future-year alternative. However, levels of access overall go down between 2006 and all future-year alternatives. This drop is mainly attributable to the drop in the number of low and moderately low income households projected by ABAG in 2035 relative to today (see Table 3-3, page 21).

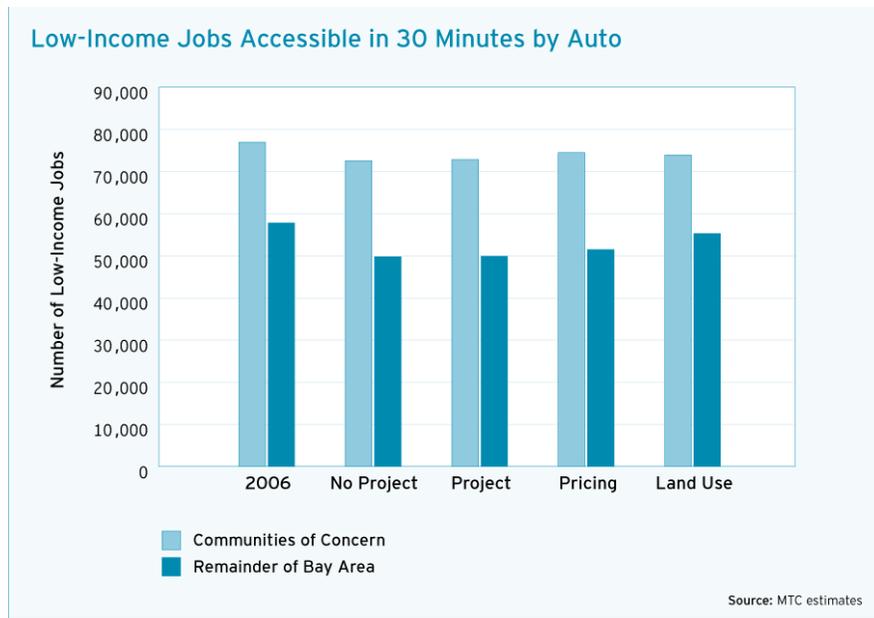


Figure 4-3. Low-Income Jobs Accessible in 30 Minutes by Auto

Because the estimate is weighted by the number of low and moderately low income households in each sub-area of the region, when the number of lower-income households falls, the average number of accessible jobs falls accordingly, with no appreciable increase in overall levels of access by auto under the Project to offset this drop. The impact of the Project on communities of concern (an average gain of 300 more jobs accessible) is barely discernable relative to the No Project, and similarly for the remainder of the region (an average gain of 100 more jobs accessible). Thus, there is no disparate distributional effect of the Plan on accessibility by automobile relative to the No Project alternative.

Of all alternatives evaluated, the Pricing and Land Use alternatives offer slightly greater accessibility gains relative to the No Project than the Project does, highlighting the important role of policy as well as infrastructure in determining access potential.

RESULTS: ACCESS BY TRANSIT

Although most work trips in both communities of concern and the remainder of the region are made by car, communities of concern have lower rates of auto ownership and higher rates of transit usage than the remainder of the region. Thus, measuring access to low-income jobs by transit is also an important equity indicator with which to measure the distributional benefits of the Transportation 2035 Plan.

As with the preceding analysis of access to low-income jobs by auto, communities of concern as a whole have better access to low-income jobs by transit than the remainder of the region, as shown in Figure 4-4. Unlike accessibility by auto, however, access by transit is steady or

increases for all future-year alternatives compared to 2006, including access for communities of concern, which increases on average by 3,200 jobs under the Project compared to 1,200 for the remainder of the region. The greatest gains for both communities of concern and the remainder of the region occur under the Land Use scenario, again underscoring the role compact development plays in accessibility rather than transportation infrastructure alone.

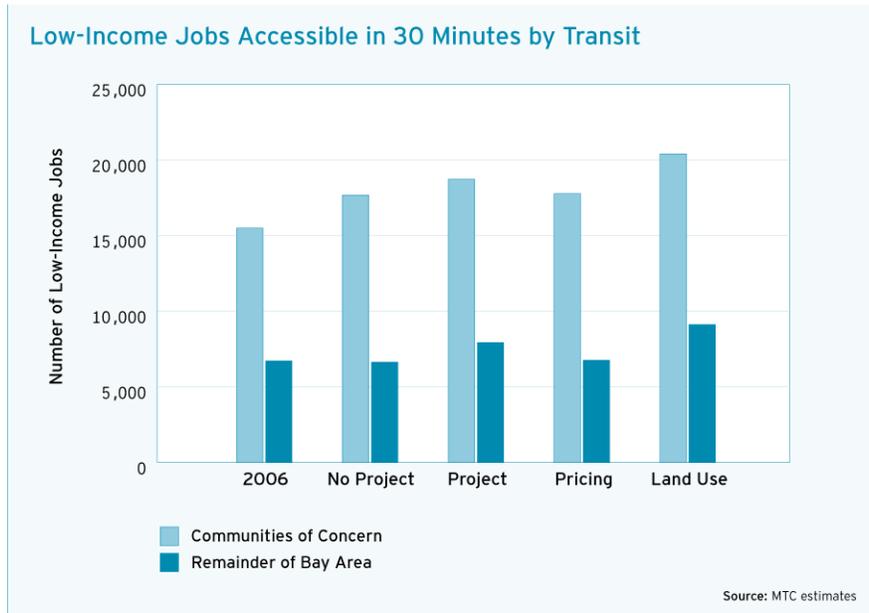


Figure 4-4. Low-Income Jobs Accessible in 30 Minutes by Transit

Comparing the Project to the No Project alternative, however, it is the remainder of the region that appears to have a slightly greater accessibility gain than communities of concern: on average the remainder of the region gains access to 1,300 additional jobs under the Project, compared to an average of 1,000 additional jobs in communities of concern. A closer examination of the results broken out by county (see Table B4 in the Appendix) suggests that the accessibility gain for the remainder of the region is weighted heavily by the effects of substantial accessibility gains in San Francisco’s non–communities of concern. Recall that these regional averages are weighted by the number of low-income households in each zone-of-residence; since the number of affected households in San Francisco is so large, they are readily able to impact the regional averages.

Looking at individual communities of concern (see Table B6 in the Appendix), the greatest accessibility gains from the Project relative to the No Project occur in central and southeastern San Francisco, western Alameda County, and Marin City. Communities of concern in outlying areas of the region including Solano, Napa, Sonoma, and eastern Contra Costa Counties see little or no gain in accessibility to low-income jobs based on the set of transit projects that was modeled for this analysis.

Table B2 in the Appendix also provides analysis results by income group as well as by community of concern, which indicate that low-income household throughout the region attain similar accessibility gains to households in other income groups relative to the No Project alternative. With the results analyzed this way, the groups that see the greatest accessibility gain by transit under the Project are *low and moderately low income households in the remainder of the region*, where half the region’s low-income households currently reside.

4.3 Access to Non-Work Activities

While access to employment is an important equity indicator in terms of economic opportunity, the majority of all trips taken are non-work trips: trips to destinations such as schools, shopping, medical appointments, social and recreational destinations, and others. These trips represent the balance of activities that people need and want to access in their daily lives.

This indicator measures the total number of non-work activities within 30 minutes door-to-door travel time by both the midday period highway network and the midday period walk-only transit network. These activities represent the sum of all trips to high schools and colleges or universities, shopping, medical/dental, personal services, and social and recreational trips (including eating meals, recreation, entertainment, and visiting). As with the measure of accessibility to low-income jobs, calculations are produced for each zone-of-residence, and then aggregated to regional averages for all communities of concern and the remainder of the region. Regional averages are produced by weighting each zone by its number of low and moderately low income households.

RESULTS: ACCESS BY AUTO

Access by auto to non-work activities within 30 minutes for each alternative is shown in Figure 4-5. As with the measure of access to low-income jobs, access overall is better in communities of concern than the remainder of the region. Unlike the measure of access to low-income jobs by auto, however, access to non-work activities increases under all alternatives compared to the base year for both communities of concern and the remainder of the region.

The differences between the Project and No Project are very slight for both communities of concern and the remainder of the region, although the Project offers a slightly greater accessibility gain (17,800 more activities accessible) in communities of concern than the remainder of the region (3,200 more activities). As with the results for low-income jobs, the Land Use alternative offers even greater accessibility gains than the Project.

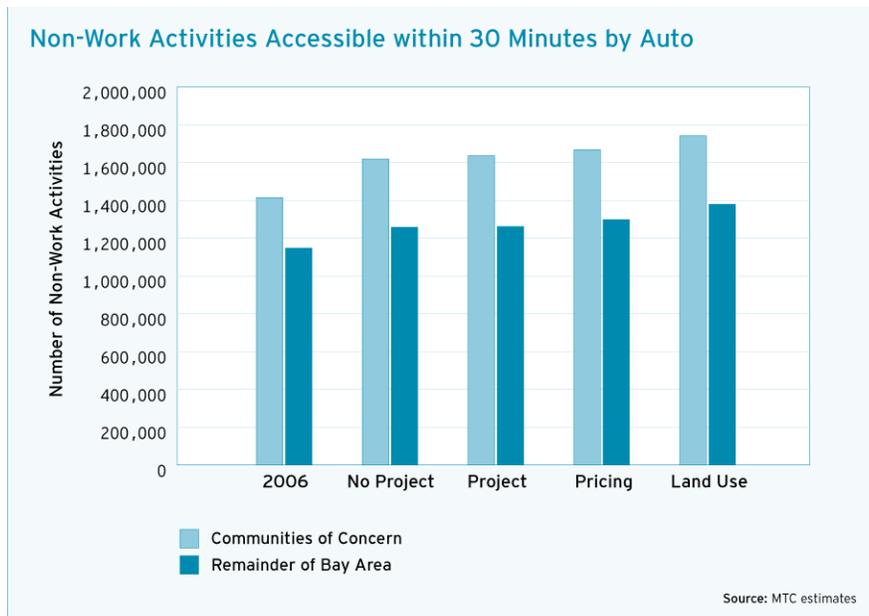


Figure 4-5. Non-Work Activities Accessible within 30 Minutes by Auto

Appendix C provides more detailed results by income group, county, and community of concern, as well as by trip type. These detailed results show that the greatest gains in access by auto under the Project are for shopping/medical/other trips, both for communities of concern and the remainder of the region.

RESULTS: ACCESS BY TRANSIT

Evaluating access to non-work activities by transit is vital for those who do not have access to cars and who rely on transit to meet daily needs. As with other accessibility measures, access to these activities by transit is greater in communities of concern than the remainder of the region, as shown in Figure 4-6, but substantially less than the levels of accessibility offered by auto seen in the preceding section.

Communities of concern overall are forecast to see a marked increase in accessibility to non-work activities by transit from 2006 to all the forecast-year alternatives, and greater increases under the Project than the remainder of the region. As with the preceding accessibility measures, the Land Use alternative produces the largest accessibility gains for both communities of concern and the remainder of the region.

Comparing the Project to the No Project, communities of concern overall see greater accessibility gains than the remainder of the region. According to the more detailed results (see Table C6 in the Appendix), the greatest gains occur in San Francisco and north-western Alameda County’s communities of concern (including Berkeley/Albany, West/North Oakland, Alameda, and Fruitvale/East Oakland), and Marin City.

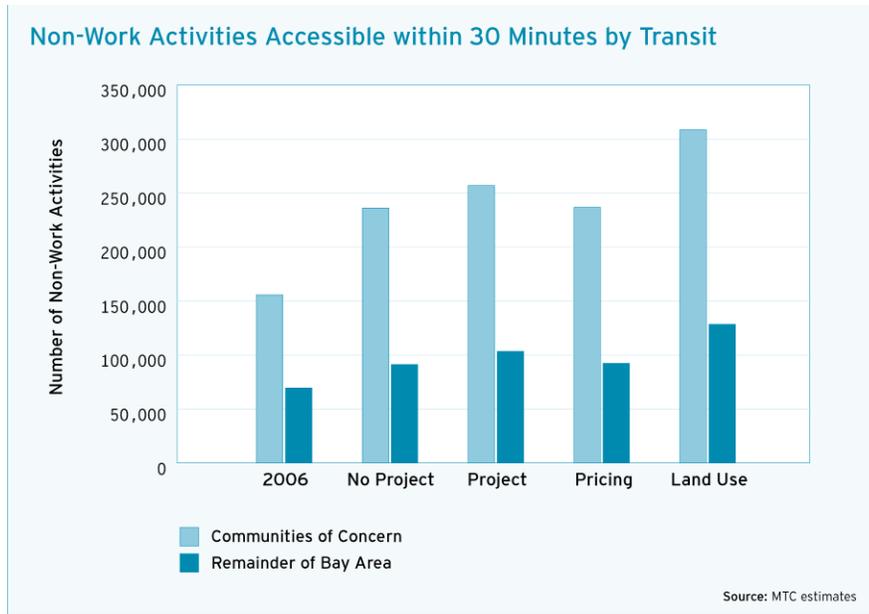


Figure 4-6. Non-Work Activities Accessible within 30 Minutes by Transit

ACCESSIBILITY ANALYSIS SUMMARY

Generally, all the accessibility results reflect the relative concentration of lower-income jobs and other destinations in the region’s core, and the relative concentration of communities of concern in the region’s core as well, with the result that that people in the region’s core have access to more job opportunities and daily activities across the board. Note these observations apply to the region as a whole; certainly there exist pockets of low-income people and households with poor access to suitable jobs (and consequently high unemployment and/or very long commutes), and poor access to shopping, healthcare, and other essential destinations. While these pockets of poor accessibility are typically in outlying suburban and rural areas, there are also some urban areas that have far poorer accessibility compared to other nearby communities as well. These issues are intended to be identified and addressed via locally based needs assessments through MTC’s Community Based Transportation Planning (CBTP) Program (see “Next Steps,” page 50), which aims to bring a variety of stakeholders to the table to address the complex nature of these challenges within these communities.

NARROWING THE ACCESSIBILITY GAP: AUTOS VS. TRANSIT

While pockets of poor accessibility persist in the region, the “opportunity gap” between the accessibility levels of those who have access to cars and those who rely on transit appears to be narrowing. In the case of both access to low-income jobs and access to non-work activities, automobiles offer a far greater level of accessibility than transit, and to an even greater degree outside of communities of concern. However, when we compare the levels of

accessibility as a ratio (the number of activities one can access by car divided by the number of activities one can access by transit), it is evident that overall those without cars are forecast to be at less of an accessibility disadvantage relative to those with cars under the Project compared with today. Table 4-2 shows these ratios of accessibility by auto to transit for both low-income jobs and non-work activities (where 1.0 would represent equal levels of accessibility offered by both auto and transit).

	Low-Income Jobs		Non-Work Activities	
	2006	2035	2006	2035
Communities of Concern	5.0	3.9	9.1	6.4
Remainder of Region	8.6	6.3	16.5	12.2
Low-Income	4.0	3.2	8.0	5.7
Not Low-Income	9.5	7.0	16.9	12.5

Source: MTC estimates

Table 4-2. Ratio of Accessibility by Auto to Accessibility by Transit

Communities of concern and low-income households throughout the region have less of an accessibility disadvantage than non-communities of concern and non-low-income households, and all groups see this relative disadvantage decrease by 2035. This is a relevant finding not only because households in communities of concern and low-income households throughout the region are more likely to lack access to an auto, but also because by 2035 a larger number and share of all the region’s households are forecast to be zero-vehicle households (see Figure 3-1, page 22).

4.4 Vehicle Emissions

Emissions from on-road vehicles include numerous pollutants. These include smog-forming pollutants, which can cause adverse respiratory effects that are regional in nature, as well as air toxics, which are chemicals which are known or suspected to be unhealthy to breathe. Exposure to air toxics at sufficient concentrations is believed to increase people’s risk of getting cancer or experiencing other serious adverse health effects.¹⁴ This equity analysis focuses on pollutants from on-road mobile sources believed to have greater health impacts from localized exposure, including diesel particulates, benzene, and 1,3-butadiene. (Other mobile-source pollutants that pose risks at the broader, regional scale, such as smog precursors, are evaluated in the Environmental Impact Report.) Diesel particulates represent approximately 70% of the inventory of mobile source air toxics included in this analysis.¹⁵

¹⁴ For more information, see the U.S. Environmental Protection Agency’s web page on Mobile Source Air Toxics at <http://www.epa.gov/otaq/toxics.htm>.

¹⁵ For information on the health risks of exposure to diesel particulates, see the California Air Resources Board’s summary at http://www.arb.ca.gov/research/diesel/dpm_draft_3-01-06.pdf.

How much of what kinds of pollutants are emitted from on-road vehicles depends on a variety of factors in addition to how many miles vehicles are traveling on the region’s major roadways (measured in vehicle miles traveled, or VMT): how fast the vehicle is traveling, whether the vehicle’s engine is warmed up, the vehicle’s fuel economy and weight class, and the type of engine fuel used.

To approximate the potential of risk from exposure to diesel particulates, benzene, and butadiene from on-road mobile sources, this analysis uses a localized emissions inventory as a proxy for exposure risk.¹⁶ MTC uses a new California-specific transportation air quality analysis tool, CT-EMFAC, to model mobile-source air toxics based on estimated VMT and vehicle speeds in each planning alternative. Vehicle travel and associated emissions are assigned either to communities of concern or the remainder of the region, depending on where the travel takes place on the region’s network of freeways, expressways, and major arterials. (More detailed explanation about this methodology and assumptions can be found in the Air Quality section in Chapter 2 of the Transportation 2035 Draft Environmental Impact Report.)

To control for the differing geographical extents of communities of concern (around 18% of the region’s land area) and the remainder of the region (around 82%), the average weekday emissions inventory is divided by the area of developed land in communities of concern and the remainder of the region: this area is the sum of all residential, commercial, and industrial land, representing areas where people and activities are typically located. This is a more effective indicator than a per-capita measure of emissions, since a per-capita measure could show results for an area of high population and high emissions as being similar to an area of low population and low emissions, even though the potential associated risk may be quite different for both areas. Thus, normalizing the total inventory by square mileage of developed land to create an emissions-density measure is likely to be a better proxy for exposure risk and thus for measuring potential burdens of the Transportation 2035 alternatives.

RESULTS

Overall, communities of concern have higher density of diesel particulates, benzene, and butadiene than the remainder of the region, as shown in Table 4-3. This is principally due to

¹⁶ Typically, exposure risk is estimated from a variety of factors including total emissions inventory (on-road mobile, other mobile, and stationary sources), distance from source, prevailing wind direction, and other socioeconomic and demographic risk factors. The Bay Area Air Quality Management District, through its Community Air Risk Evaluation (CARE) Program, is developing a methodology to evaluate localized exposure risks to air toxics based on air quality models that more accurately predict the location and extent of concentrations, but these models do not produce estimates for 2035. For more information on the CARE Program, see <http://www.baaqmd.gov/CARE/index.htm>.

the proximity of many communities of concern to the region’s freeway network, with the result that a relatively greater share of vehicle miles of travel on the region’s major roadways occur in communities of concern compared to the remainder of the region.

Mobile Source Air Toxics Emissions Density					
Diesel Particulates, Benzene, and Butadiene: Kg per average weekday per square mile					
	2006	No Project	Project	Pricing	Land Use
Communities of Concern	5.92	1.29	1.26	1.24	1.29
Remainder of Bay Area	2.26	0.48	0.46	0.47	0.47
Total Region	2.94	0.64	0.61	0.61	0.63

Source: MTC estimates

Table 4-3. Mobile Source Air Toxics Emissions Density

Compared to the 2006 base year, the density of diesel particulate, benzene, and butadiene emissions goes down substantially under all 2035 alternatives, and more so for communities of concern than the remainder of the region. This is largely due to the projected impacts of technology and regulatory changes on vehicle emissions that will take effect in the next few years. Some of these changes include:

- Federal regulations on benzene content in gasoline and fuel containment (going into effect 2011);
- The California Air Resources Board’s vehicle fleet-efficiency standards under AB1493 (known as Pavley rules) which are more stringent than federal Corporate Average Fuel Economy (CAFE) standards (beginning 2009 and ramping up through 2016);
- CARB’s Pavley Two standards that further raise average vehicle efficiency of California’s statewide fleet (beginning 2017 to 2020).

This analysis does not include CARB’s private-fleet regulations of diesel exhaust adopted December 2008 that will apply to privately owned heavy-duty trucks and buses beginning in 2011. CARB projects these regulations will provide significant statewide reductions in diesel particulate emissions.¹⁷

Overall, these results indicate the substantial impact of technology and regulations on emissions, impacts which, when compared to the base year 2006, overwhelm any realized by infrastructure investments in the Project or policy alternatives in the Pricing and Land Use scenarios. Compared to the No Project alternative, the Project provides similar but slightly greater benefit to communities of concern (a reduction of 0.03 kilograms per day per square

¹⁷ See <http://www.arb.ca.gov/msprog/onrdiesel/documents/truckruleoverview.pdf> for more information on CARB’s private-fleet rule.

mile) than the remainder of the region (a reduction of 0.02 kilograms). The Pricing alternative offers the greatest reduction to communities of concern of all the alternatives. Nevertheless, in all future year alternatives, communities of concern overall have higher average density of mobile source air toxics emissions than the remainder of the region.

Strategies to evaluate and mitigate the impacts of outdoor toxic air contaminants (including on-road mobile sources) are being pursued by The Bay Area Air Quality Management District through its Community Air Risk Evaluation (CARE) Program. More information on how MTC is supporting these efforts is described in the “Next Steps” section (page 50).

Additional detailed results for this indicator, broken out by pollutant type and by county and community of concern, are available in Appendix D. This analysis shows the highest emissions densities in communities of concern in downtown and eastern San Francisco and in Marin County. Nevertheless, most communities see a reduction in emissions under the Project compared to the No Project alternative (see Table D7 in the Appendix).

4.5 Affordability Test Measure

The final indicator evaluated in this analysis is an experimental test measure of affordability, which was first tested in the Fall 2007 Transportation 2035 Vision Analysis.¹⁸ Affordability is measured as the share of household income an average household spends on housing and transportation combined, stratified by income level. The basis of this measure is the performance measure MTC adopted for the Transportation 2035 Plan for its Equity goal, with the objective to reduce by 10% from today’s levels the combined costs of housing and transportation costs as a share of income for the region’s low and moderately low income households. These income groups are selected to focus the affordability analysis more on working families rather than higher-income households. Housing and transportation costs are examined together because many households may trade-off one or the other in making locational decisions, choosing cheaper housing and a longer commute, for example, or more expensive housing in dense areas where fewer autos are needed to meet daily needs.

This measure of affordability was developed by the independent Center for Neighborhood Technology (which also developed a unique methodology for estimating transportation costs based on residential location) and is calculated as follows:

$$\text{Affordability} = \frac{\text{Average Housing Cost} + \text{Average Transportation Cost}}{\text{Average Household Income}}$$

¹⁸ For details on the Affordability test measure in the Vision Analysis, see Chapter 3 of the Transportation 2035 Performance Assessment Report: http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035Plan-Perf_AssessmentReport.pdf.

For this analysis, MTC developed its own methodology for estimating transportation costs by income group using expenditure data from the U.S. Bureau of Labor Statistics' Consumer Expenditure Survey for 2006, MTC forecasts of household auto ownership by income level, and MTC work trip forecasts by means of transportation to work by income level.¹⁹ These estimates produce average auto ownership costs, auto operating costs, and transit fare costs for each zone-of-residence in the region by income group. For this analysis, these estimates are then aggregated to produce estimates for all low and moderately low income households in either communities of concern or the remainder of the region.

Estimating housing costs as a share of income by income level relies on Census 2000 and American Community Survey data on housing affordability by zone-of-residence. While this estimate is fairly straightforward to produce for 2006 based on recent data, producing a reliable forecast for housing costs as a share of income for 2035 proved difficult. Given this limitation, this analysis assumes housing costs keep pace with inflation, with the result that housing costs as a share of income don't change much from today's levels in 2035.

Income estimates are provided by ABAG, including forecasts for households by income group for 2035 (see Table 3-3, page 21). Notably, ABAG forecasts a decrease in the regional number and share of low-income households by 2035 (with increases in the number and share of higher-income households), and an increase in the mean income for the lowest income group, controlling for inflation (see Table 2-1, page 8). The result is that rising incomes have as much effect on this indicator as any changes in housing or transportation costs.

RESULTS: LOW PLUS MODERATELY LOW INCOME HOUSEHOLDS

According to 2006 estimates, the region's low and moderately low income households combined spend an average of 60.6% of income on housing and transportation costs. These households in communities of concern spend a higher percentage of income on housing and transportation (62.5%) than low and moderately low income households in the remainder of the region (59.5%), a trend that continues in all 2035 alternatives, as shown in Figure 4-7. This trend is largely due to average incomes in communities of concern being lower (\$37,227 for all low and moderately low income households in 2006) than those for the remainder of

¹⁹ Forecast transportation costs are based on the following assumptions: Walk and bike commute trips are assumed to have no cost (even though there are costs associated with these trips, they are typically small relative to other modes). Carpool commute trips split the cost of the auto trip by the number of vehicle occupants. Parking costs are forecast using a ratio of future-year gross employment density to base-year gross employment density, multiplied by the base year parking price. By this methodology, 2035 parking costs in San Francisco's Financial District would attain \$539 per month in today's dollars. Transit fares are assumed to keep pace with inflation. Bridge tolls are not assumed to keep pace with inflation; hence, a \$4 toll in today's dollars will be worth about \$1.90 in 2035 dollars. Auto operating costs require two major assumptions, about average fuel prices and average fuel economy. Assumptions on future fuel prices are based on a ten-year regression model based on published gas prices from April 1998 through April 2008, putting the 2035 price at \$7.47 per gallon in today's dollars.

the region (\$42,867 in 2006), since both housing and transportation costs are lower on average in communities of concern than the remainder of the region. Appendix E provides more detailed information on the affordability indicator by income level, as well as estimated values for each variable: transportation, housing, and incomes.

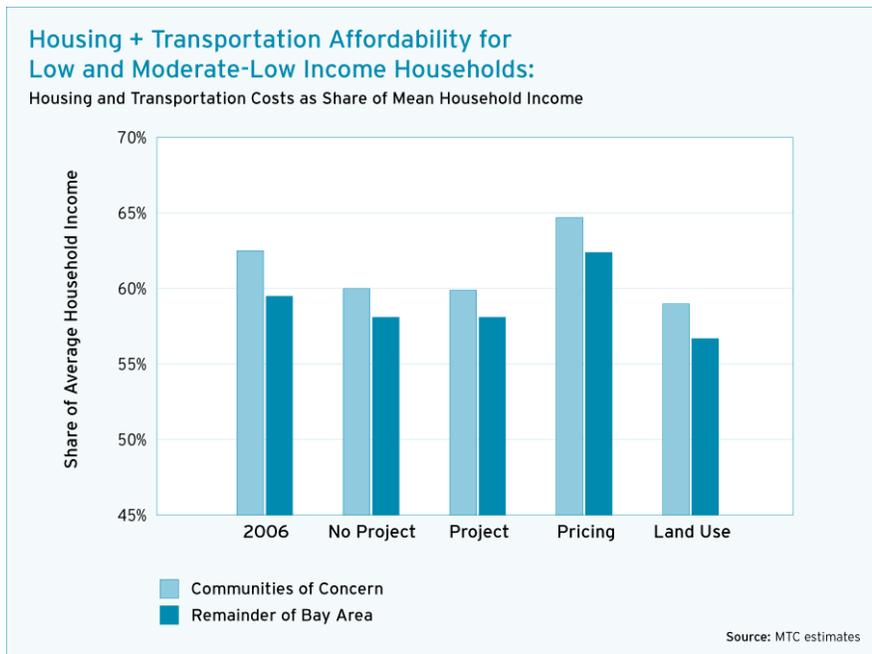


Figure 4-7. Housing + Transportation Affordability: Low and Moderately Low Income Households

Comparing the impacts of the Project to the No Project scenario, the Project has no significant impact on affordability for either communities of concern or the remainder of the region. However, the Pricing scenario has a dramatic effect on affordability for low and moderately low income households in both communities of concern and the remainder of the region, due entirely to increased transportation costs (incomes and housing costs do not change between the No Project, Project, and Pricing alternatives). The Land Use scenario, on the other hand, decreases transportation costs (generally by producing shortened distances for work trips and lower household vehicle ownership rates), thereby reducing the total combined costs of housing and transportation as a share of income.

RESULTS: LOW INCOME HOUSEHOLDS

In response to concerns that the income threshold in the analysis of low plus moderately low income households was too high to represent the potential affordability impacts on the region’s lowest-income residents, the same analysis was conducted for the lowest-income group only (those households with incomes less than \$40,000, with an mean income of \$23,000), as shown in Figure 4-8. While overall the trends with respect to comparing the various alternatives to each other were similar as in the preceding analysis, this analysis

suggests how great an affordability burden is placed specifically on the region’s low-income households.

These high cost burdens are due in large part to the very high cost of housing in the region (50% of low-income households’ average income, which is dramatically higher than the standard affordability threshold of 30%). On top of such high housing costs, virtually any level of transportation costs could be considered a burden, especially for those low-income households that own and operate vehicles. As seen in Chapter 3 (see Figure 3-3, page 25), estimated transportation costs in 2006 represented 26.7% of average income for low income households (most of which were automobile-related costs).

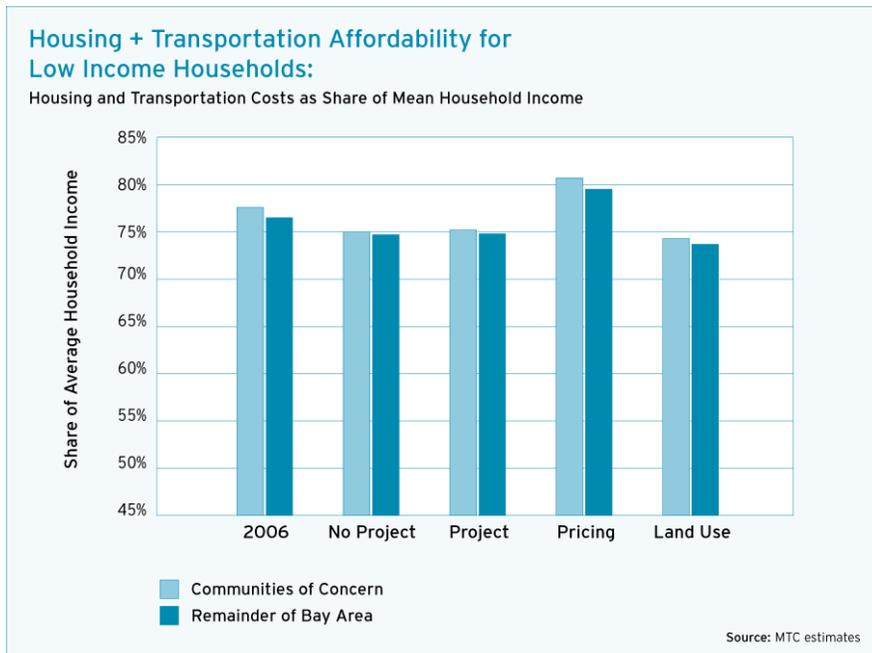


Figure 4-8. Housing + Transportation Affordability: Low Income Households

While this analysis does not show any disproportionate effect of the Project on communities of concern compared to the No Project, it does underscore the need for further examination and understanding of the housing and transportation cost trade-offs low-income households must make. MTC’s efforts to better analyze these trade-offs at the neighborhood level is discussed in Chapter 6 (see page 51).

5 SUMMARY AND CONCLUSIONS

Chapter Highlights

- Overall, the Transportation 2035 Plan distributes transportation benefits and burdens equitably for the region’s low-income and minority communities of concern.
- The Transportation 2035 Plan helps close the “accessibility gap” between how much people can access by auto and how much can be accessed by transit.
- Policy mechanisms and technology seem to have greater impact on outcomes than transportation infrastructure investments.
- Affordability proved difficult to evaluate, but transportation infrastructure alone does not appear to have much impact on households’ transportation costs.

5.1 Summary of Results

Based on the analysis results presented in the previous chapter, the Transportation 2035 Plan distributes transportation benefits and burdens equitably; there is no systematic disbenefit to low-income and minority communities of concern, and in almost all cases these communities fare at least as well or better than the remainder of the region as a result of the proposed investments. The financial analysis showed that the Plan’s major investments in transit, which is proportionately utilized more heavily by low-income households, results in a greater overall per-household expenditure for low-income households than other households in the region.

The table below summarizes the modeled equity indicators in terms of the key questions identified:

Key questions	Low-Income Jobs Accessible by Auto	Low-Income Jobs Accessible by Transit	Access to Non-Work Activities by Auto	Access to Non-Work Activities by Transit	Emissions Density	Affordability
Are conditions in communities of concern better overall than the remainder of the region?	Yes	Yes	Yes	Yes	No	No
Do conditions in communities of concern improve under the Project relative to the No Project?	Yes	Yes	Yes	Yes	Yes	No Change
Do communities of concern receive similar or greater benefit compared to the remainder of the region under the Project, relative to the No Project alternative?	Yes	No	Yes	Yes	Yes	Yes

A closer examination of the accessibility results in particular revealed that the Transportation 2035 Plan also helps close the existing “accessibility gap” between auto and transit. However, overall autos still provide greater accessibility than transit, putting transit-dependent households at a relative accessibility disadvantage to those households that choose or can afford to own and use automobiles.

Looking at other alternatives besides the infrastructure investments of the Project alternative (the Pricing and Land Use scenarios) suggested that for many issues of concern to low-income and minority communities (such as access to jobs or vehicle emissions), transportation infrastructure plays less of a role in changing outcomes than policy factors. In particular, the alternative land use scenario puts a greater number of jobs and destinations within easier reach of low-income households, while the Pricing scenario reduced emissions density by shifting more motorized trips off the roads. Perhaps the most meaningful impact seen in the analysis was that of regulations and technology on reducing mobile-source air toxics emissions from 2006 levels of today.

Housing and transportation affordability as a test measure proved challenging, mainly because the cost and relative affordability of housing proved difficult to forecast. For the purposes of this analysis, perhaps the most significant lesson learned from this measure was how limited is the impact of infrastructure investments alone on affordability, and on transportation costs in particular.

5.2 Stakeholder Feedback

The equity analysis that MTC conducts for each long-range regional transportation plan typically generates considerable stakeholder interest and feedback. While MTC strives for an open, participatory process in developing the analysis methodology, sharing results, and engaging in discussion of their implications, many stakeholders, including MTC’s Minority Citizens Advisory Committee, ultimately felt that this analysis did not adequately reflect how the proposed Transportation 2035 investments would affect communities of concern.

Much of this concern has to do with the limitations of doing long-range travel forecasting. These limitations include (1) having to use a regional (as opposed to very localized) approach to analyzing outcomes and (2) reliance on numerous long-range socioeconomic assumptions underlying the travel modeling, assumptions which numerous stakeholders simply did not see as being very credible.

These issues of defining and measuring equity are an ongoing dialogue among MTC and its stakeholders that has occurred over the development of the past several regional

transportation plans. How MTC plans to address these issues going forward is described in the following chapter.

6 NEXT STEPS

Chapter Highlights

- MTC is pursuing development of new technical and analytical tools that will be implemented in the next RTP equity analysis.
- MTC will continue its commitment to identify and prioritize solutions to transportation gaps in low-income communities by completing Community Based Transportation Plans in the remainder of the 43 identified communities.
- The Transportation 2035 Plan adds \$400 million in new financial commitment to the Lifeline Transportation Program. MTC will evaluate the program's first cycle of projects to assess whether the program is meeting its objectives.

This chapter describes ongoing and near-term efforts MTC is undertaking to continue to address issues of equity and environmental justice in its regional transportation planning activities. While it is not an exhaustive list, it does highlight MTC's major financial and technical commitments to promoting regional transportation equity.

6.1 Promote Involvement in Activity-Based Model Development

MTC is currently developing the next generation of its travel demand models, which the agency expects to use for the next Regional Transportation Plan update scheduled for 2013, in conjunction with a planned update of the regional household travel survey (BATS, described in Chapter 2). Among other features, the new model system is distinguished from the existing trip-based system (used in this and previous analyses) in that travel and activity choices are fully disaggregated to an “activity-based” system. Such a system can better reflect the travel choices and behavior of low-income and minority households and communities, as well as a broader range of people with limitations to getting around by the private auto, including young people, older adults, people with disabilities, and zero-vehicle households. This development will be ongoing in 2009, with household survey development planned thereafter. These activities represent opportunities for MTC's Minority Citizens Advisory Committee and others to provide input and feedback on MTC's data gathering, travel forecasting, and analysis methods that will be the basis of future RTP equity analyses, with the hope that future analyses will better represent the region's diverse population and travel behavior.

6.2 Develop a Regional Mobility Snapshot Analysis

Perhaps the strongest feedback MTC staff received from the Minority Citizens Advisory Committee and other stakeholders on this equity analysis is that its analytical approach does not directly address the differing levels of access and mobility that exist *within the region today*. Rather, the RTP equity analysis relies on long-range forecasts to estimate and compare aggregate outcomes between communities of concern and the remainder of the Bay Area *region-wide in the future*.

MTC has a growing wealth of data and analytical techniques (such as regional transit service data, economic data, and geospatial analysis and mapping) that can be used evaluate overall access and mobility at the level of individual neighborhoods in current and recent years. The short-term assessment could create a “snapshot” analysis of existing conditions, ideally with the goal of tracking access and mobility in communities of concern over time, highlighting potential community-oriented actions, and informing policies and programs such as the Lifeline Transportation Program. Such an analysis could more effectively answer the question “Are access and mobility improving in communities of concern?” than long-range forecasting exercises through the RTP equity analysis have been able to do.

MTC staff will engage a variety of advisors and stakeholders beginning in 2009 to develop the scope and methodology for this analysis. A key element of this process will be determining how findings from this type of analysis can inform future RTP equity analyses.

6.3 Monitor and Evaluate the Lifeline Transportation Program

The Lifeline Transportation Program funds projects that improve mobility for the Bay Area’s low-income communities. The Transportation 2035 Plan adds \$400 million in new investments over 25 years to the region’s Lifeline Program, on top of the \$216 million committed under the 2005 regional transportation plan, *Transportation 2030*, and \$18 million programmed on an interim basis prior to the availability of the program’s long-term funding beginning in 2008.

The Lifeline Program is administered at the county level based on regional policy objectives, and MTC will continue to monitor the program’s local implementation. The three-year interim funding cycle (FY05 to FY08) is currently concluding, with 39 projects funded throughout the region, while the second cycle of funding is in the process of being programmed. An interim evaluation of the program’s administration was conducted in early 2008; however, a more thorough evaluation of the program’s outcomes and impacts will need to be conducted to assess how the funded projects are meeting program objectives.

6.4 Complete Remaining Community Based Transportation Plans

In October 2002, the MTC adopted program guidelines to conduct transportation planning in communities of concern throughout the Bay Area via the Community Based Transportation Planning (CBTP). Each community's planning process results in a collaboratively developed transportation plan that identifies community-prioritized transportation gaps, and projects or services to address these gaps. Projects recommended in each plan are eligible to compete for funding through MTC's Lifeline Transportation Program. A total of 43 communities of concern were identified for CBTPs. Phase One of the CBTP program provided for the completion of a total of 25 plans. In April 2008, MTC approved Phase Two, which provides an additional \$1 million commitment to complete plans for the remaining 18 communities.

As with the Lifeline program, the CBTP program is administered at the county level under regional policy guidance. With the financial commitment now in place to complete plans in all 43 communities, MTC will continue to monitor the plans' completion and support implementation of the program's objectives.

6.5 Support the Bay Area Air Quality Management District's CARE Program

The Bay Area Air Quality Management District began the Community Air Risk Evaluation (CARE) Program in 2004 to evaluate potential health risks from exposure to toxic air contaminants from both stationary and mobile (including on-road) sources. Phase One of the CARE Program found that on-road mobile sources of toxic air contaminants account for 34% of the region's cancer toxicity-weighted emissions by source category, 33% of chronic toxicity-weighted emissions (toxicity resulting from prolonged or repeated exposure), and 38% of acute toxicity-weighted emissions (toxicity resulting from a single exposure or exposure over a short period of time).²⁰ The Air District through its analysis has identified six priority communities as being most impacted by exposure to toxic air contaminants: Eastern San Francisco, San Jose, East Oakland/San Leandro, West Oakland, Richmond, and Concord. As the Air District develops and implements air quality mitigation measures prioritizing these communities, MTC will continue to work with the District to monitor the contributions of on-road mobile sources to these most at-risk communities.²¹ Detailed results from this equity analysis in Appendix D highlight MTC's defined communities of concern that roughly correspond to the priority communities identified by the CARE Program.

²⁰ See http://www.baaqmd.gov/CARE/documents/care_p1_findings_recommendations_v2.pdf.

²¹ See <http://www.baaqmd.gov/CARE/index.htm>

6.6 Further Evaluate Housing and Transportation Affordability in the Region

Based on the complex and highly localized nature of housing and transportation affordability in the region, MTC is working with the independent Center for Neighborhood Technology to develop a more detailed, location-specific evaluation of housing and transportation affordability within the Bay Area. The purpose of this study is to evaluate the factors that contribute to higher household transportation costs, better understand the trade-offs that households make between housing and transportation costs in making locational decisions, and develop policy recommendations for enabling more affordable housing and transportation options for households of all income levels in the region. This study is expected to be completed in early 2009.

7 REFERENCES AND FURTHER INFORMATION

7.1 Related Transportation 2035 Publications

DRAFT TRANSPORTATION 2035 PLAN FOR THE SAN FRANCISCO BAY AREA: CHANGE IN MOTION

http://www.mtc.ca.gov/planning/2035_plan/index.htm

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE TRANSPORTATION 2035 PLAN

http://www.mtc.ca.gov/planning/2035_plan/EIR.htm

TRANSPORTATION 2035 PERFORMANCE ASSESSMENT REPORT

http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035Plan-Perf_AssessmentReport.pdf

7.2 MTC DataMart

MTC's online DataMart is a portal to numerous surveys cited in this report. Numerous reports summarizing these surveys are also available in the MTC-ABAG library.

U.S. CENSUS AND AMERICAN COMMUNITY SURVEY PAGE

http://www.mtc.ca.gov/maps_and_data/datamart/census

AMERICAN COMMUNITY SURVEY 2007 DATA HIGHLIGHTS

http://www.mtc.ca.gov/maps_and_data/datamart/census/ACS2007_DataHighlights.pdf

AMERICAN COMMUNITY SURVEY 2006 DATA HIGHLIGHTS

http://www.mtc.ca.gov/maps_and_data/datamart/census/ACS2006_BayArea_DataHighlights_Nov2006.pdf

BAY AREA TRAVEL SURVEY (BATS)

http://www.mtc.ca.gov/maps_and_data/datamart/survey

TRANSIT PASSENGER DEMOGRAPHIC SURVEY

http://www.mtc.ca.gov/maps_and_data/datamart/survey/2006_transit.htm

TRAVEL MODELS AND FORECASTS

http://www.mtc.ca.gov/maps_and_data/datamart/forecast

ACTIVITY-BASED MODEL DEVELOPMENT

http://www.mtc.ca.gov/maps_and_data/datamart/abm/